TO STUDY THE PREVALENCE OF HEADACHE AND ITS CHARACTERISATION AFTER INTERMITTENT PHOTIC STIMULATION IN PATIENTS UNDERGOING EEG

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I hereby declare that the dissertation entitled "**TO STUDY THE PREVALENCE OF HEADACHE AND ITS CHARACTERISATION AFTER INTERMITTENT PHOTIC STIMULATION IN PATIENTS UNDERGOING EEG"** submitted towards partial fulfillment of the requirements for the award of **DM in Neurology** degree to BFUHS is a compilation of original work carried out by me under the supervision of **Dr Gagandeep Singh,** Prof. & Head, Department of Neurology, **Dr Monika Singla,** Professor, Department of Neurology. No part of this thesis has formed the basis for the award of any degree previously.

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I dedicate this thesis work to my late friend ***Yasmeen****-unseen, unheard but always near, still loved, still missed, and held so dear.*

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Iqbal Singh

ABBREVIATIONS

5HT1D-	5 HYDROXYTRYPTAMINE RECEPTOR 1D
ASM-	ANTI SEIZURE MEDICINE
CDEM-	CHRONIC DISORDERS WITH EPISODIC MANIFESTATIONS
CI-	CONFIDENCE INTERVAL
DALY-	DISABILITY ADJUSTED LIFE YEAR
EEG-	ELECTROENCEPHALOGRAM
EMA-	EUROPEAN MEDICINES AGENCY
FDA-	FOOD AND DRUG ADMINISTRATION
GABA-	GAMMA AMINO BUTYRIC ACID
GBD-	GLOBAL BURDEN OF DISEASE
HV-	HYPERVENTILATION
ICHD-	INTERNATIONAL CLASSIFICATION OF HEADACHE DISORDERS
IHS-	INTERNATIONAL HEADACHE SOCIETY
ILAE-	INTERNATIONAL LEAGUE AGAINST EPILEPSY
IL-	ILLINOIS

IPS- INTERMITTENT PHOTIC STIMULATION

LEV- LEVETIRACETAM

NA/K-ATPASE- SODIUM POTASSIUM ADENOSINE TRIPHOSPHATASE

OPD- OUT PATIENT DEPARTMENT

PIH- POST ICTAL HEADACHE

PPR- PHOTOPAROXYSOMAL RESPONSE

Q1- QUESTION 1

Q2- QUESTION 2

Q3- QUESTION 3

RCT- RANDOMIZED CONTROLLED TRIAL

SPSS- STATISTICAL PACKAGE FOR SOCIAL SCIENCES

SRH- SEIZURE RELATED HEADACHE

SD- STANDARD DEVIATION

TPM- TOPIRAMATE

USA- UNITED STATES OF AMERICA

VAS- VISUAL ANALOGUE SCALE

ABSTRACT

Introduction: The study draws connections between two neurological disorders, migraine and epilepsy, highlighting similarities, such as episodic nature and co-occurrence in some patients. It discusses historical perspectives and findings from studies showing overlapping symptoms and treatment options.

Objectives: To study the prevalence of headache and its characterisation in patients undergoing EEG with intermittent photic stimulation, and to study the past history and family history of migraine in patients having headache post photic stimulation.

Methods: The study was conducted in a hospital-based EEG laboratory, covering a period of 15 months. Patients aged 8 and above, undergoing EEG with IPS, were included while certain groups like unconscious patients, pregnant women, and those intoxicated or unstable were excluded. Data collection was done using structured questionnaires filled by patients online before and after the EEG test.

Results: Among 597 patients, 2.8% reported headaches immediately after EEG/IPS, and 5.1% within three days post-procedure. Most headaches were mild in intensity and brief in duration. 20.8% of patients were found to have pre-existing migraine, and 20.1% had a positive family history of migraine, with mothers being the most commonly affected relative.Patients with a past history of migraine or a family history of migraine showed a statistically significant higher likelihood of developing headaches after EEG/IPS. The study also indicated that previous migraine sufferers were more susceptible to experiencing headaches post-IPS.

Conclusion: The study suggested that IPS could act as a trigger for headaches, particularly among those with a predisposition due to past or family history of migraine.The study calls for future research to confirm the findings and explore possible treatments, such as antiseizure medications if the headaches are determined to be epileptic in nature.

Keywords: (migraine; epilepsy; intermittent photic stimulation; post ictal headache; family history)

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INTRODUCTION

Migraine and epilepsy, both are common neurological disorders. Association of both of these disorders have been observed in many studies.[1] Although epilepsy and migraine have different clinical presentations, there is a similarity in both of them which is that they both occur in episodes and the patients diagnosed with them experience symptoms occasionally and there is variability in the interictal interval between attacks; and in between attacks, affected individuals may not experience any symptoms.[2] The similarities in these two diseases of migraine and epilepsy respectively were highlighted by British neurologist Sir William R. Gowers in 1906 in his talk at the National Hospital for the Paralysed and Epileptic, Queen Square, London.[3] He acknowledged that epilepsy and migraine frequently coexist in the same patient and that there are similarities between the two disorders regarding their "character and nature."

The chronic disorders with episodic manifestations (also known as CDEM) have a hallmark feature which is periodic bouts of dysfunction in nervous system interspersed with a return to baseline.[2] Headaches (including migraines) and epilepsy are the most prevalent CDEM that neurologists treat; together, they account for about 20% of outpatient neurological consultations.[2, 4] The most prevalent association between seizures and migraine probably is occurrence of seizures followed by symptoms like migraine. Post-ictal headaches are often in distinguishable from migraine. They occur commonly with equal proportion in patients with or without a family history of migraine.[2] Post-ictal headaches might be characterized into tension headaches, migraine headaches, or unclassified headaches.[5]

In a study conducted by Lipton *et al* (1994), it was observed that individuals with epilepsy are more likely to suffer from migraine than their relatives without epilepsy by more than two times.[6] Marks and Ehrenberg[7] reported that 79 out of 395 (20%) individuals with epilepsy

also had migraine. Baulac *et al* (2001), in their study, found that the prevalence of epilepsy in a sample population of 1830 migraine patients was 5.9%.[8]

Numerous researchers have noted that symptoms of post-ictal headache (PIH)are similar to the symptoms of migraine among a notable percentage of individuals ranging from 41–56%. These symptoms include pounding pain accompanied with nausea, photophobia, and phonophobia. Furthermore, antimigraine medications have been shown to exert an impact on PIH in certain instances.[2, 9] Although it is rare for a migraine to cause a seizure, headaches are frequently associated with seizures. Post-ictal headaches are frequent and can resemble migraine like attacks, whereas preictal and ictal headaches are uncommon.[10]

An additional similarity between epilepsy and migraine that lends credence to the idea of same underlying processes is using some antiseizure medications (ASMs) in treating both disorders. Significant evidence from randomized controlled clinical trials is present that highlights the use of divalproex sodium (valproate) and topiramate for preventing the occurrence of migraine attacks. The U.S. Food and Drug Administration (FDA) has licensed both these medicines for this indication.[1] Antiseizure medicines have traditionally been the mainstay of care for epileptic patients who also experience post-ictal headaches. The treatment of post-ictal headache itself has not gotten much attention.[11] Various techniques which were traditionally performed for activation during scalp EEG recording as per standard protocol are namely Hyperventilation (HV), intermittent photic stimulation (IPS), and sleep deprivation.[12, 13]

In the laboratory conducting electroencephalography (EEG) laboratory, the procedure used routinely for identifying any epileptogenic discharges sensitive to flickering light in both adults and children is IPS. This activating technique is also used for examining individuals who are suspected or confirmed to have epilepsy during

electroencephalography (EEG) recordings.[13] Photo-paroxysmal responses (PPRs) have been documented in migraine.[14] They have also been observed in patients with dementia, Parkinson's disease, head trauma, and alcohol withdrawal[15] but IPS is most helpful when evaluating epilepsy.[13] It is observed to provide helpful information in up to 10% of paediatric and adult patients.[16] So, it is recommended to perform it during routine EEG recording procedure.[17]

Headache, epilepsy, and photosensitivity are all associated with sporadic variations in brain excitability, and it is recognized that these illnesses can facilitate one another, even if the physiological mechanisms that underlie them are still not entirely understood. This interaction is elicited, for instance, by IPS which can cause migraine, epileptic seizures, PPR EEG responses, and other associated clinical manifestations. Numerous researchers have examined the EEG during a migraine episode. Occurrence of three spontaneous scintillating scotomas during a clinical migraine attack were described by Engel *et al* (1945) to have slow waves in irregular pattern coming from the contralateral occipital region. The EEG abnormalities vanished along with the scotomas.[18] When doing an inter-ictal EEG (or video-EEG) recording in accordance with the standardized international protocol, rather than emphasizing the EEG abnormalities alone, special emphasis should be given to the ictal onset of the clinical EEG finding as they occur quite frequently.[19] In the 1963 Headache Symposium, which was moderated by Merritt, an informative overview suggested that, in the majority of cases, there is no EEG change during a clinical migraine attack. The two main exceptions were when a patient had a neurological deficit and when there might be a slowing in the appropriate occipital area during a visual migraine prodrome.[20] At the very least, it's intriguing to consider if these slow waves which disappear when the attack terminates could be an ictal or epileptiform pattern.[21] An example of an electro-clinical phenomenon that lends credence to the idea that migraines might have an epileptiform basis is the "dysrhythmic migraine of Weil" (1953, 1962).[22, 23]

While headache as an epileptic symptom is a fascinating subject, current research has concentrated on headache characterized as sole sign of an epileptic seizure, namely ictal epileptic headache.[24, 25] Only in idiopathic occipital lobe epilepsy which is a type of epilepsy recognises strong link between migraine and epilepsy.[26-28] The first symptoms that appears in both occipital epilepsies and migraine is visual aura. It is further followed by a headache and other autonomic symptoms. Recognising headache as the manifestation of epilepsy still remains as a challenge.[29]

Curiously, it is well known that headaches and seizures from occipital region of the brain start with visual symptoms progressing to headaches and other manifestations associated with epilepsy. They can also co-occur. These cases have been documented in both idiopathic "benign occipital epilepsy" and symptomatic cases involving lesions or transitory abnormalities inside the occipital lobe.[25, 30]
Despite the fact that epilepsy and migraine have many pathophysiological characteristics, migraine is rarely found to be the only ictal manifestation of epilepsy or as a trigger for manifestation of epilepsy happening subsequently. It is so because the threshold for onset of migraine is significantly lower than the onset of seizure.[19]

There is a frequent disregard of symptoms of headache symptoms both by the patients and their treating physicians because patients with epilepsy exhibit more concerns for their seizure than their headaches. This would explain why both illnesses are often classified as two independent paroxysmal diseases which are thought mostly to display as comorbidity in epidemiological and clinical practice.[31, 32]

Therefore, this study aims to study the prevalence of headache in patients undergoing EEG with intermittent photic stimulation, its characterization, and to discuss the temporal and etio-pathogenetic relationships between headache, epilepsy, and photosensitivity. No prior studies have been done till date which have studied the

prevalence of headache and its characterisation after EEG/IPS test. This study will guide us in establishing a relationship, if any, between photosensitivity and headache, and to study whether the headache reported after the test was migrainous or not.

AIMS AND OBJECTIVES OF THE STUDY

PRIMARY OBJECTIVE

- To study the prevalence of headache and its characterization after intermittent photic stimulation (IPS) in patients undergoing EEG and to determine whether IPS acts as a precipitating risk factor for migraine attack.

SECONDARY OBJECTIVE

- To study the past history of migraine in patients having headache after photic stimulation.
- To look for family history in patients having headache post photic stimulation.

REVIEW OF LITERATURE

History

Tissot highlighted the unique connection between epilepsy and migraine as early as1783[33]. According to Paskind (1934), there was a correlation between epilepsy and headaches, as highlighted by 13 different writers. However, he also listed 10 other authors who disagreed, arguing that there was no unique association between the two conditions.[34]

The issue was covered in detail by British neurologist Sir William R. Gowers (1907) in his book "The Borderland of Epilepsy".[35] He brought out the similarities between migraine and epilepsy in his lecture at the National Hospital for the Paralysed and Epileptic, Queen Square, London. According to him, migraine was a borderland disease to epilepsy "near it but not of". He acknowledged that epilepsy and migraine frequently coexist in the same patient and that there were similarities between the two disorders' character and nature.

Lennox and Lennox coined the term "migralepsy" in 1960(though they gave credit to Dr. Douglas Davidson) to characterize a disorder in which "ophthalmic migraine was followed by symptoms characteristic of epilepsy."[36]

Pathophysiology

While epilepsy and migraine present with different clinical manifestations, they share a key similarity- both are episodic disorders where symptoms occur sporadically. The interval between episodes, known as the inter-ictal period, varies, and individuals affected by either condition may experience symptom-free periods between attacks.[37] Another notable similarity which supports the idea of underlying mechanisms between epilepsy and migraine, is the effectiveness of certain ASMs in treating both conditions. Both topiramate and divalproex sodium (valproate) have been found to be

effective in preventing migraine attacks in many randomized controlled trials. They are also approved by the U.S. FDA for migraine use.[38] ASMs decrease neuronal hyperexcitability through a variety of mechanisms.[39]

For treating migraine, gabapentinoids, such as gabapentin and pregabalin, may also be effective.[40, 41] Other ASMs which have been reported to be effective in prophylaxis of migraine include levetiracetam and zonisamide.[42] The treatment of epilepsy patients who experience post-ictal headache has primarily centered on ASMs only, while the specific management of post-ictal headaches has received relatively little attention.[11] Evidence gathered from preclinical studies conducted in rats has shown that by spreading depolarization seizures can be followed.[43-46] However, it has been observed that post-ictal spreading depolarization has only been observed in humans with brain damage[47, 48], which indicates that post-ictal headache may not be caused due to this mechanism.

Findings from various experiments suggest that neurons become hyperpolarized after the end of tonic-clonic seizures rather than staying depolarized.[49] This neuronal suppression occurring in the post-ictal phase happens abruptly and extensively, rather than in a spreading manner. Preclinical studies have suggested that the factors contributing to post-ictal silencing are varied[50,51], which includes release of astrocytic adenosine, vesicular transmitter depletion in relation to the hypoxia and acidosis.[52] None of these were highlighted in initiation of spread of depolarization.

No evidence from clinical trials indicates that there is a role of spreading depolarization in post-ictal neuronal silencing. In individuals with epilepsy, adenosine levels were observed to increase postictally for up to 18 minutes following seizures[53], and post-ictal acidosis is supported by observations of post-ictal hypercapnia[54] and increased

plasma lactate levels.[55] However, there is a lack of clinical evidence for post-ictal neurotransmitter depletion.[56]

An analysis was conducted on neocortical tissue both from people with chronic epilepsy and rat model of epilepsy. In this, it was indicated that the intrinsic alterations in GABAergic transmission could have likely reduced the spreading depolarization in tissue from where the seizure originated in the brain.[57]

Particularly, the Na^+–K^+ ATPase pump may be involved in regulating seizure susceptibility by affecting membrane depolarization and influencing cortical spreading depression (Haglund and Schwartzkroin, 1990)[46], which is regarded as a primary factor in activating the trigemino-vascular system during headache pathogenesis.[58]

Epidemiology

Migraine and epilepsy are common episodic neurological disorders. According to the Global Burden of Disease (GBD) 2019 report, epilepsy and migraine affect 1% and 14% of the global population, respectively. Migraine is found to be more prevalent in females than in comparison to males. Globally, a total of 20.7% of women and 9.7% of men are reported to have migraine.[59]

With an annual rate of 14.1 per 1000 individuals, the incidence of migraine with aura is highest in women between ages 12 and 13 years whereas migraine without aura occurs between the age range of 14 to 17 years and rates 18.9 per 1000 individuals annually.[60, 61]

In the study conducted by Toldo *et al* (2010), it was highlighted that epilepsy and migraine are strongly associated. They reported that the compared to tension-type headaches, epilepsy was 3.2 times more prevalent in individuals with migraine. They also reported that no significant difference was observed between individuals with migraine with aura and those with migraine without aura. Migraine and epilepsy

also exist together as a comorbid condition. Focal epilepsy was found to be most common in migraineurs. Patients with migraine affected with focal epilepsy when compared with those with idiopathic epilepsy, were found to likely develop cryptogenic epilepsy by three times (75%).[31] Baulac *et al* (2001) found that the prevalence of epilepsy in 1830 migraineurs was 5.9% in their study.[8] Another study by Marks and Ehrenberg[7] reported that according to IHS, 20% of patients with epilepsy also had history of migraine. It was observed that chance of developing migraine was 2.4 times higher for patients with epilepsy when compared with those without epilepsy. The frequency of epilepsy in migraineurs ranged from 1 to 17%, while in patients with epilepsy, it varied from 8 to 24%.[6, 31, 37] This suggests that the risk of migraine gets doubled in individuals affected with epilepsy than that of the general population.[2, 9]

In children and adults, post-ictal headaches and migraine are found to be the most common, with a higher occurrence in children than in adults (headaches: 33.0% vs 29.0%, migraines: 23.0% vs 16.0%). A study by the help group mentioned in its systematic review that 66.4% of individuals experience post-ictal headaches after a single seizure. This represents that post-ictal headaches are a significant burden, particularly for those who experience frequent seizures.[62]

Women with epilepsy frequently display catamanial patterns in which effects of hormones during, immediately before and immediately after the menstrual cycle are more commonly viewed as triggers for seizures rather than as primary risk factors for epilepsy itself. This differs from migraines, where key role for the increase of risk of migraine in women is believed to be played by cyclic hormonal changes, beginning at menarche, and in triggering individual migraine episodes.[63]

Correlation between migraine and epilepsy

Recent studies focus on ictal epileptic headache which as per the definition is only manifestation of a seizure in epilepsy. As a symptom

of epilepsy, headache is thought to be an interesting issue and the focus is recent time have shifted to ictal headache.[24, 25]

In rare cases, migraine solely manifests as a result of epileptic seizure or trigger's objective manifestation of epilepsy subsequently though many features of pathophysiology are shared among both epilepsy and migraine. This happens because as compared to the threshold of the onset of seizure which is much higher, onset of migraine happens at much lower threshold.[19]

Recently, the time-based association between seizure in epilepsy and headache has become a subject of debate. It has become a topic of revisiting as this association which might occur in multiple ways and this makes it an interesting phenomenon. [19, 64-68]

When both epilepsy and migraine occur in the members of the same family the chances of having headache as only manifestation of epilepsy appear to be higher.[69, 70]

Headache in relation to seizure can occur at any time with its actual manifestations. It can precede (pre-ictal), follow (post-ictal) or occur (ictal) along with the seizure manifestations and hence occur in their close temporal proximity.[36]

Post-ictal headache, i.e. headache following the actual seizure manifestations may be of many types, namely, migraine, tension or unclassified type.[5]

In a study in which 78 articles were included from across the globe, a variety of post-ictal symptoms were examined. Most of these studies provided reported headaches, migraines, and psychoses as the symptoms after the occurrence of seizures. The mean weighted frequency was calculated for these symptoms and it was found to be 33.0%, 16.0%, and 4.0% for headache, migraine and psychosis respectively. Various types of epilepsy and/or epilepsy syndromes were included in most of these studies, so it was possible to generalize these estimated to people with any type of epilepsy. Aphasia, paresis, nose rubbing/face wiping, and coughing were the other symptoms that were identified to be reported frequently. Nose rubbing/face wiping and aphasia in 48.0% of them, followed by aphasia in 34.0% and coughing

in 31.0%. Paresis was found to be reported in 10.0% of them which is least among all the reported symptoms.[71]

The most common type of peri ictal headache, i.e., headache occurring in temporal proximity of the seizure is post-ictal headache. It is indicated through various studies that it occurs in <45% of people with epilepsy, thus making it the most frequent type.[72, 73]

A meta-analysis study published in 2019 indicated that 33.3% of individuals with epilepsy reported to have post-ictal headache while 16% had post-ictal migraine.[71]

It was also found that in about half of the individuals who reported to have headache after a seizure, the headache was like migraine.[74]

In significant proportion of patients ranging from 41% to 56%, post-ictal headache symptoms were found to be similar to that of migraine, including pounding pain accompanied with nausea, sensitivity to light and sound. It has been highlighted by many researchers.

It is also found that post-ictal occur more commonly in individuals with convulsive seizures than those who have nonconvulsive seizures.[75]

In a study conducted by Ito *et al* (2004)[106], it was found that in people having generalized tonic-clonic seizures, the incidence of post-ictal headache was found to be significantly higher than in those with other types of seizures. This confirmed that findings of other studies conducted previously.[75, 76]

Interesting findings were made while studying post-ictal headache in individuals having focal epilepsy. It was observed that headache after seizure was found more commonly in whom the seizures originated from the occipital lobe when compared with those individuals in whom they originated from temporal or frontal lobe region of the brain.[77]Post-ictal headache can also occur after focal seizures with impaired awareness originating from the temporal region.[78]

Close association between epilepsy and migraine is acknowledged only in a subgroup of epilepsies, which are idiopathic occipital lobe epilepsies.[26-28] Both of them begin with a visual aura in the form of

stars, dots etc. followed by headache and other autonomic symptoms. Manifestation of epileptic seizure in the form of headache still remains a challenge.[29]

In the study conducted by Ito *et al* (2004), it was observed that the region of the brain from which a seizure originates in the brain of an individual had a significant role in deciding whether the individual will have post-ictal headache similar to migraine or not. There was a strong correlation observed between occipital lobe epilepsy and migraine-like post-ictal headache.[79] The structure of the brain which is found to be highly responsible for the development of migraine is occipital lobe.[78, 80]

Remarkably, it is well known that headaches occur in concurrence with seizures originating from the occipital lobe region of the brain. It begins with visual symptoms followed by headache and other manifestations of an epileptic seizure. It has been reported both in cases with the idiopathic form, “benign occipital epilepsy” and those which are symptomatic with lesion or abnormalities in transition in the occipital lobe region.[25, 30]

Existence of epilepsy and migraine as general comorbid conditions can possibly have several explanations besides the observation that trauma to head can be a cause for both of them. One of them could be that as the attacks in migraine could be epileptogenic, and may lead to the development of epilepsy over time or vice versa recurrent seizures could lead to the development of migraine but there is unlikely any epidemiological data indicating this explanation.[10, 81]

As FDA approved use of ASMs such as valproate (VPA) and topiramate (TPM) in individuals with migraine, it has provided important evidence of overlap between the two conditions.[82] In a RCT conducted by de Tommaso *et al* (2008), it was found that TPM and levetiracetam (LEV) were able to normalize impaired cortical excitability which is similar to migraine. On the other hand, drugs such as the propranolol (b-blocker), the flunarizine (Ca^{2+}channel blocker) and the tricyclic

antidepressant amitriptyline, developed to prevent migraine, also show some anti-epileptic effect.[83]

EEG and Headache

In the electroencephalography (EEG) laboratory, intermittent photic stimulation (IPS) is a routine procedure used in both adults and children to identify abnormal epileptogenic sensitivity to flickering light, also known as photosensitivity. For examining individuals with suspected or confirmed diagnosis of epilepsy, IPS is among one of the techniques used for activating or stimulating during electroencephalography (EEG) recordings.[13]

Headache, epilepsy, and photosensitivity are all associated with sporadic variations in brain excitability, and it is recognized that these illnesses can facilitate one another, even if the physiological mechanisms that underlie them are still not entirely understood. This interaction is elicited, for instance, b yIPS, which can cause migraine, epileptic seizures, photoparoxysmal responses (PPR), and other associated clinical manifestations.

The standard protocol for IPS is presenting to a patient series of photic flashes via strobe light. This is done at a distance of about 20 to 30 cm measured from the face of the patient during eye closure. This is followed by a series of stimulus trains with gradual increase in frequency up to 30 Hz for a period varying from 4s to 10s, providing a break of 4s within each train.[13, 84]

PPR's, formerly known as photo-convulsive response, occur when IPS generates bilaterally synchronous epileptiform discharges which may outlast the stimulus by several seconds. And sometimes, this may lead to a seizure precipitation. PPRs can be further divided into two types: (1) limited to the stimulus train (self-limited), or (2) self-sustained (non self-limited). The latter has higher chances of being associated with clinical seizures.[13]

Various responses which can be observed after intermittent photic stimulation are described in Table 1.

TYPES OF RESPONSES IN IPS-

PHOTIC DRIVING RESPONSE	PHOTOPAROXYSOMAL RESPONSE	PHOTOMYOGENIC RESPONSE	PHOTOELECTRIC RESPONSE	ELECTRORETINAL RESPONSE
Represents repetitive visual evoked potentials produced in response to the photic flash. It occurs in a *time-locked fashion 100 ms after the stimulus.*	Occurs when IPS produces synchronous epileptiform discharges bilaterally which *may outlast the stimulus by several seconds.*	Repetitive contractions of the frontalis muscle synchronized to the light flash at a delay of 50–60 ms.	Occurs due to photochemical response produced by the electrodes, and may coexist with other waveforms, such as eye movement artifacts.	Generated from retinal ganglion cells, and might be seen in the frontal leads, mimicking an abnormality.

Table 1 – Different types of responses noted after Intermittent Photic Stimulation. See text for details.

Various studies have been conducted in which the EEG recorded during attack of migraine have been studied by the investigators. Engel *et al* (1945) reported three cases of acute migraine attack having spontaneous scintillating scotomas with EEG findings showing irregular slow waves originating in the contralateral occipital region. The EEG changes also normalised after the disappearance of scotomas.[18]

One feature in EEG recording which helps to observe any cerebral hyperexcitability is the H-response of Golla and Winter (1959), which is referred to the relatively high amplitude of the photic response recorded over the occipital regions to IPS that is usually maintained above 14 flashes/sec, up to or above 20/sec. instead of what is normally seen as the decrease in the amplitude.[85]

The notion that headache may have an epileptiform basis is provided some support by "The dysrhythmic migraine of Weil" (1953,1962). It is a particular type of electro-clinical entity.[22,23]In the patients who usually have episodes of aphasia or syncope, EEG displays high voltage diffused slow waves in them. The important point in such cases is that the drug of choice in these patients is found to be an ASM and not an ergot derivative. Also, Heyck (1969) observed that bilaterally synchronous and symmetrical spike and wave complexes were reproduced by IPS in approximately 60% of migraine patients with EEG abnormalities. So, Heyck concluded that a migraineur, similarly to an epileptic patient, was under the continuous and constant control of cerebral hyperexcitability.[86]

Specific inter-ictal abnormalities are exhibited particularly by children with migraine with aura (43.5%). In over one-third of the subgroup with individuals having migraine with aura, PPR was detected.[87]

In an interesting case report of a girl of adolescent age group who had long-lasting complaints of migraine, consultation with paediatric neurologist was done afterwards.[14] She had no improvement with standard antimigrainous drugs. Though there wasn’t any suggestion to label her headache as epileptogenic, they conducted an EEG and what they observed were continuous epileptiform discharges in the occipital region, which was considered as an EEG correlate of migraine attack(Beaumanoir, 1993; De Romanis *et al*, 1993).[88]Intravenous diazepam resulting in normalisation of EEG changes (along with headache) made them almost certain to consider it as an epileptic event. This case report, proved for the very first time that migrainous

headache can also be a manifestation of an epileptic phenomenon, and that benzodiazepines can be used to treat acute migraine attacks.

It was in agreement with the hypothesis that possible pathophysiology behind both epilepsy and headache could be that of transient cortical excitability(Chronicle *et al*, 2006; Calabresi *et al*, 2007).[82]

EEG abnormalities to patterned IPS can be used to signify the persistence of photosensitive epilepsy, but abnormalities to diffuse IPS are more likely to indicate the patient is poorly controlled and at risk of further seizures.[89]

Management of Post-Ictal Headache

In the individuals with epilepsy, the concern about the occurrence of their seizures is usually higher than that of headache. So, symptoms related to headache are often neglected both by the patients themselves and also by their treating physicians. This might be the reason why these disorders viewed as two paroxysmal diseases existing separately. At the most, they are considered to be epidemiological and clinical comorbidity.[31, 90]

It is important for physicians treating the individuals with epilepsy and managing their care to actively enquire about ictal, pre ictal, and post-ictal headaches. It should be mandatory to have an EEG recording to discover the area of origin of headache and ensure that whether they are of epileptic region or not, particularly in the cases where atypical peri ictal headaches of short duration are reported.[91, 92]

Once the headache intense or moderate, be it interictal or peri ictal, is reported by an individual, it should be treated with analgesics after correct diagnosis. In cases where epilepsy and migraine occur con-comitantly, ASM which have been proved to be efficient in treatment of migraine should be prescribed. This could help in avoiding poly pharmacy and possible drug–drug interactions.[93, 94]

The FDA and EMA have approved the use of ASMs topiramate and valproate for treating migraine.[95-97] But neither of these is suitable for the treatment of women of childbearing age unless there is

unavailability of other effective treatment because they can be teratogenic.[98]Lamotrigine among other ASMs, can be used off label, especially for migraine.[99]

Ironically, one of the common side effects of ASMs is headache and it is reported in more than one-tenths of the patients. Headaches occur more commonly in association with the ASMs including carbamazepine, phenytoin, lamotrigine and levetiracetam.[100]

It is important to take into account the potential for medication side effects while assessing headache in individuals with epilepsy. When treating a migraine rather than epilepsy, lower dosages of topiramate, valproate, or lamotrigine are utilized; yet, migraineurs still appear to be more susceptible to the side effects of these drugs than epilepsy patients.[101]

Furthermore, persons who have migraines or migraine with epilepsy are more likely to stop taking their medications than people who only have epilepsy.[101] There is currently no evidence linking migraine medications and seizures. Individuals with pharmaco-resistant focal epilepsy might benefit from a resection of the epileptic focus as those who become seizure free after the surgical procedure range from 34–74%.[102]

Among the several studies that have been conducted on potential treatments for post-ictal headaches, one article reported on the use of flunarizine for treatment. Of the 14 patients who had post-ictal headaches and were included in the study, 13 reported to have relief in the symptoms to some degree the intake of flunarizine.[103]

Another study that included case summaries of patients experiencing post-ictal migraines reported that the duration of headaches had shortened in these patients with the use of sumatriptan as a treatment.[11]

Post-ictal headaches occur commonly. They are often severe and in general, they tend to happen after generalized and complex partial

seizures. Migraine with or without the presence of aura is found to be treated effectively by sumatriptan, a potent 5HT1D-like agonist.[104]Determining whether the use of sumatriptan can be effective in other forms of post-ictal headache can be appropriate. As post-ictal headaches can be found to debilitate more than the seizures in some individuals so it can help in their treatment in them.

MATERIALS AND METHODS

Study design – Hospital based hypothesis generational study.

Setting- EEG Lab, Neurology Department, Dayanand Medical College and Hospital, Ludhiana.

Study period- 1st December,2022 to 1stMarch,2024 – (15 months).

INCLUSION CRITERIA-

- Patients with age ≥ 8 years presenting to OPD, emergency, ward, undergoing an EEG/IPS.

EXCLUSION CRITERIA-

- Patients presenting as status epilepticus.
- Unconscious patients.
- Pregnant patients.
- Intoxicated with alcohol or any other drug abuser.
- Unstable and non-cooperative patient.

METHODOLOGY-

The study was conducted among all patients who underwent EEG with Intermittent Photic Stimulation (IPS) at EEG Lab, Neurology Department, Dayanand Medical College and Hospital, Ludhiana during 15-month period from 1st December,2022 to 1st March,2024, satisfying the inclusion criteria. A written informed consent was taken from all of the patients enrolled in this study.

Definitions

Migraine ,as per ICHD-3 criteria, is defined as below-

Diagnostic criteria:

A. At least five attacks fulfilling criteria B-D

B. Headache attacks lasting 4-72 hr (untreated or unsuccessfully treated)
C. Headache has at least two of the following four characteristics:
    1. unilateral location
    2. pulsating quality
    3. moderate or severe pain intensity
    4. aggravation by or causing avoidance of routine physical activity (eg, walking or climbing stairs)
D. During headache at least one of the following:
    1. nausea and/or vomiting
    2. photophobia and phonophobia
E. Not better accounted for by another ICHD-3 diagnosis.[105]

Epilepsy is defined by any of the following conditions-

1. At least 2 unprovoked (or reflex) seizures occurring >24 h apart.

2. 1 unprovoked (or reflex) seizure and a probability of further seizures similar to the general recurrence risk (at least 60%) after 2 unprovoked seizures, occurring over the next 10 years.

3. Diagnosis of an epilepsy syndrome.[106]

Post-ictal headaches**-**Headache caused by an epileptic seizure, occurring <3 h after the end of the seizure event and remitting spontaneously <72 h after seizure termination.[107]

The post-ictal period is referred to as the period after a seizure has occurred and is associated with various physiological and behavioural symptoms.[108-110]

Post-ictal headaches,paresis, aphasia, coughing, nose rubbing, and automatisms have all been reported in epilepsy. The symptoms can

last for minutes, hours, or even days, and can be debilitating as they can persist long after a seizure has ended.[62, 111]

Hyperventilation (HV), intermittent photic stimulation, and sleep deprivation are collectively referred to as activation techniques traditionally performed during standard scalp EEG recording.[12, 13]

Study tool

Lipton *et al* (2003)[112]conducted a study including 563 patients who reported headaches in the last three months from when the data was collected from them. They were administered a screening questionnaire for migraine which they had to complete themselves. This screening questionnaire was a semi-structured one which were all to be filled completely. After its completion, the diagnosis of migraine was made as per the criteria defined by the IHS. Amongst 9 screening questions for migraine diagnosis, three items namely, disability, nausea, and sensitivity to light were found to have a combined sensitivity, specificity and positive predictive value of 81%, 75%and 93% respectively. Its test-retest reliability came to be 0.68, which is considered good statistically. The original version of it was developed in the English language. All those who responded positively to two or more items among the three (disability, nausea, and sensitivity to light) were considered to screen positive for migraine. This ID Migraine screen was a valid and reliable screening tool for migraine headaches, and its 'easy to use and operate' characteristics suggested that it could be of great help in improving migraine screening in primary care.[112]

We in our study screened for migraine using the ID-Migraine questionnaire. It was thought to be an appropriate tool containing simple questions for screening the subjects scheduled for EEG during the study period. It helped in rapid screening of the study subjects who were asked to fill it during their visit to the EEG laboratory because it can be used easily and administered by the individual himself/herself. Its sensitivity was found to be 81% (95% CI, 77% to 85%) in the

original study while in the validation study of the translated version of ID-Migraine (vernacular languages of Hindi and Punjabi) for use in India conducted by *Sahu P et al* (2023).[113]The sensitivity of the combined (Hindi and Punjabi), Hindi and Punjabi were reported to be 94% (95% CI, 79% to 99%), 90% (95% CI, 80% to 96%), 86% (95% CI, 68% to 96%) respectively. The specificity of the English version was 75% (95% CI, 64% to 84%)[112]while for the combined (Hindi and Punjabi), Hindi and Punjabi versions it was 49% (95% CI, 32% to 65%), 56% (95% CI, 31% to 78%) and 43% (95% CI, 23% to 66%) respectively.[113]The translated versions though demonstrated higher sensitivities but their specificities were relatively lower than the original version. This was perfectly acceptable because ID-Migraine is a screening tool and not a diagnostic tool which is supposed to have both high sensitivity and specificity.[113]

A structured interview was conducted with each subject, using a standardized questionnaire in the format of Google forms that were shared on the patient's smart phone via an online link shared on WhatsApp in their respective languages (Punjabi, Hindi, English).The questionnaire addressed various characteristics of the headache, its duration, severity, and presence of associated symptomatology like nausea/vomiting, photophobia or phonophobia. A family history of migraine in first degree relatives was also inquired about.

Patients were sent two online generated links on their smart phone, one PRE EEG Form, and the other one POST EEG Form, with language being as per patient preference (Punjabi / Hindi / English). The PRE EEG forms were supposed to be filled by the patient him/herself or by the accompanying attendants just before the EEG test, in the reception area, with questionnaire about the patient demographic details, standardised migraine questionnaire adapted from the Lipton's ID-Migraine Questionnaire. In the PRE EEG form, there were 3 questions regarding the characteristics of pre-existing headache. And if the score was 2 or more than 2 out of 3, patient was diagnosed to be having pre-existing migraine.

The POST EEG forms were sent online to the patient's smart phone after the completion of EEG/IPS test and were advised to fill the forms after 72 hours, while at home. A reminder message was sent to their smart phones after 48 hours of test to cut down the follow up drop rate. The POST EEG form was also a questionnaire regarding the occurrence of headache after EEG/IPS test and its characteristics regarding duration, severity, similar headache in past, and requiring any relief for headache.

STASTICAL ANALYSIS

Data were described in terms of range; mean ±standard deviation (± SD), frequencies (number of cases) and relative frequencies (percentages) as appropriate. For comparing categorical data, Chi square ($\chi 2$) test was performed and fisher exact test was used when the expected frequency is less than 5. A probability value (*p* valueless than 0.05) was considered statistically significant. All statistical calculations were done using SPSS (Statistical Package for the Social Science) SPSS 21.0 version(SPSS Inc., Chicago, IL, USA)statistical program for Microsoft Windows.

ETHICAL CONSIDERATIONS

Written informed consent of all participants was obtained before gathering any information. The information collected was kept strictly confidential and individual identity was not disclosed under any circumstances. Study was carried out after taking approval from Institutional Ethics Committee, Dayanand Medical College and Hospital, Ludhiana. Results of the study were used only for academic purposes and for framing recommendations for improvement in services and for no other purposes.

OBSERVATIONS AND RESULTS

A total of 597 patients who underwent EEG with IPS in EEG Laboratory, Department of Neurology, Dayanand Medical College and Hospital, Ludhiana, over a period of 15 months (1st December,2022 to 1st March, 2024)were enrolled in this study.

The number of patients who filled the PRE EEG forms were 597 and out of these, 524 filled up the POST EEG forms. Amongst all 597 patients, 494 (82.7%) patients filled up all the columns of the form accurately, and hence were included in the final analysis.

Demographic Characteristics

AGE GROUP	No. of cases	Percentage
< 20	187	31.3%
21-40	281	47.1%
41-60	105	17.6%
> 60	24	4.0%
Total	597	100.0%

Table 2: Distribution of patients based on their age.

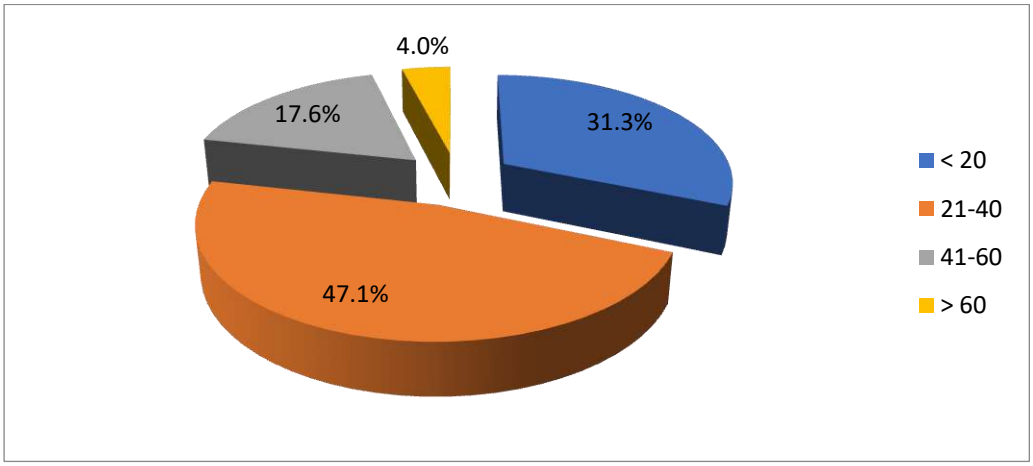


Figure 1: Distribution of patients based on their age.

About half of the patients (281/597; 47.1%) who completed the PRE EEG forms were in the age group of 21-40 years of age followed by age group of less than 20 years (187/597; 31.3%). Patients aged 41-60 years and more than 60 years of age constituted 17.6% and 4.0%, respectively.

Sex	No. of cases	Percentage
Female	263	44.1%
Male	333	55.8%
Transgender	1	0.2%
Total	597	100.0%

Table 3: Distribution of patients based on their sex.

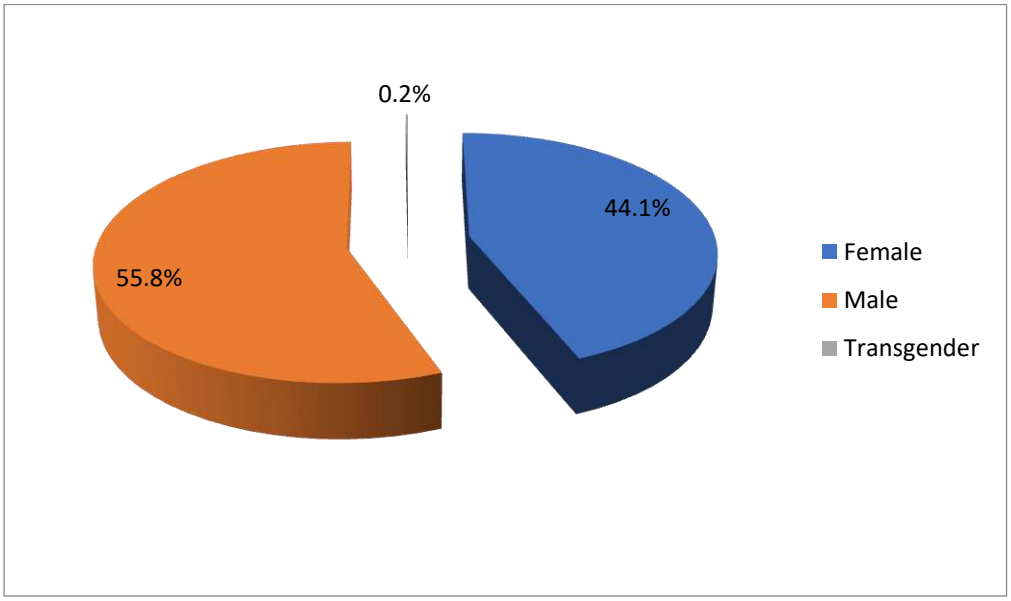


Figure 2: Distribution of patients based on their sex.

In this study, most patients were males (333/597; 55.8%) followed by females (263/597; 44.1%). Only one patient (0.2%)was transgender amongst all.

ID-Migraine Questionnaire Responses

Has the headache limited your activities for a day or more in the last three months?	No. of cases	Percentage
0	400	67.0%
1	197	33.0%
Total	597	100.0%

Table 4: Response of patients to Q1 as per Migraine ID Questionnaire.

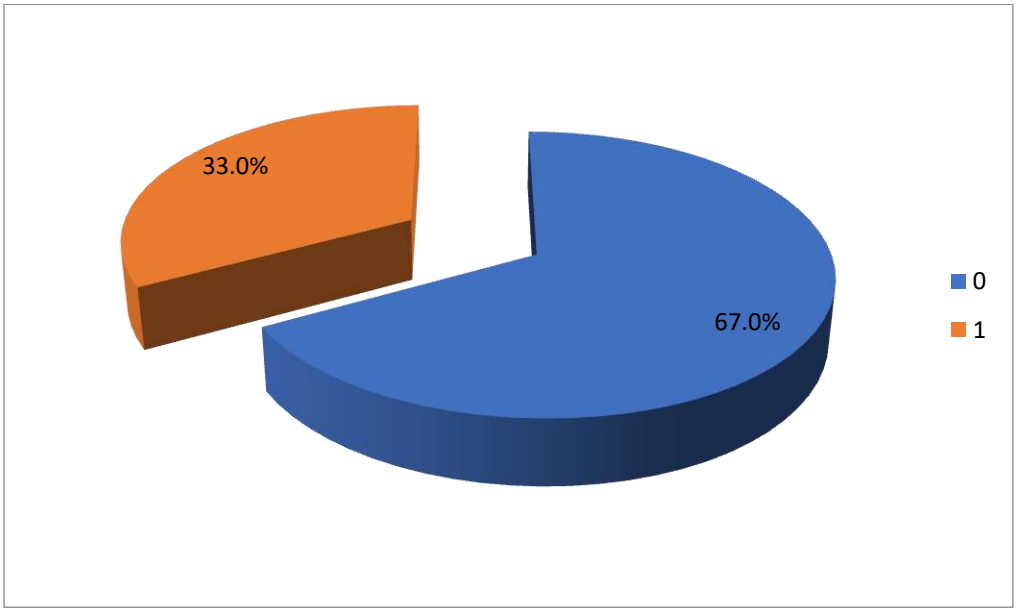


Figure 3: Response of patients to Q1 as per Migraine ID Questionnaire.

Majority of the patients (400/597; 67.0%) reported that headache limited their activities for a day or more in three months before the survey. One-third of them (197/597; 33.0%) mentioned that within three months before data collection, their activities were limited due to headache.

Are you nauseated / sick to your stomach when you have a headache?	No. of cases	Percentage
0	481	80.6%
1	116	19.4%
Total	597	100.0%

Table 5: Response of patients to Q2 as per Migraine ID Questionnaire.

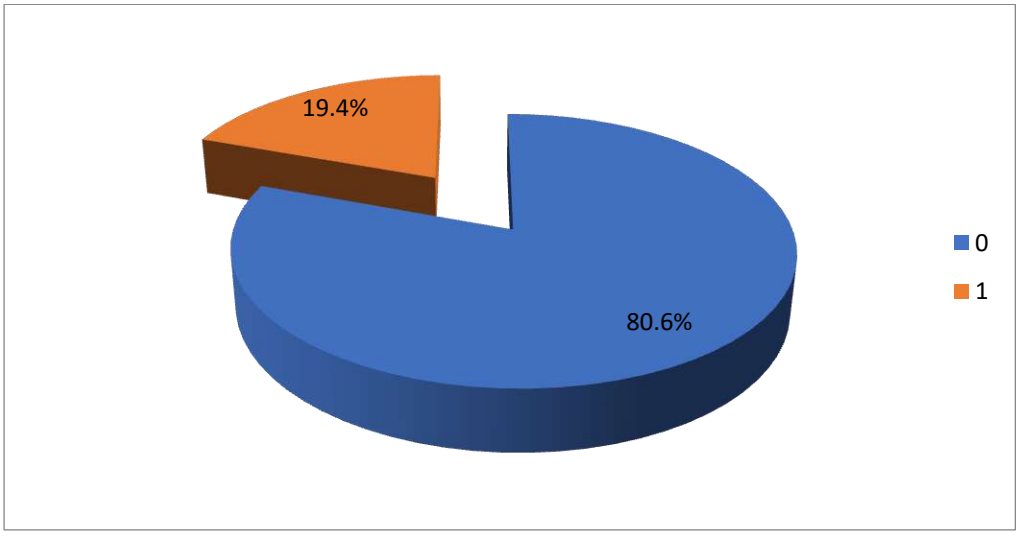


Figure 4: Response of patients to Q2 as per Migraine ID Questionnaire.

Most of the patients (481/597; 80.6%) reported that they did not feel nauseated or sick to their stomach when they have a headache but 116 (19.4%) of them said that they do feel this way.

Does light bother you when you have a headache?	No. of cases	Percentage
0	444	74.4%
1	153	25.6%
Total	597	100.0%

Table 6: Response of patients to Q3 as per Migraine ID Questionnaire.

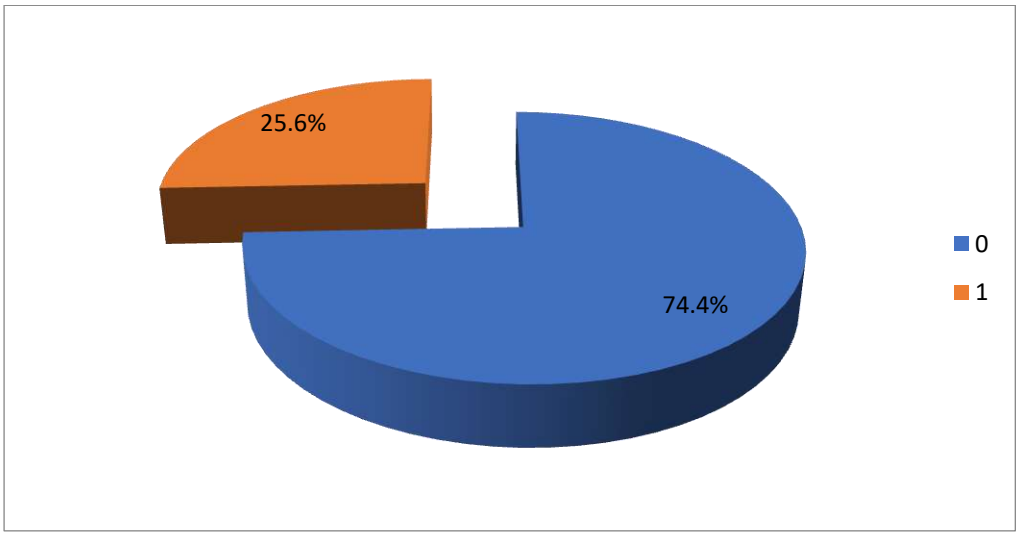


Figure 5: Response of patients to Q3 as per Migraine ID Questionnaire.

Almost three-fourths of the patients (444/597, 74.4%) said that light did not bother when they have a headache while the remaining one-fourths of them (153/597; 25.6%) highlighted that they are bothered by the light during headache.

ID-Migraine Questionnaire scores

SCORE	No. of cases	Percentage
0	294	49.2%
1	179	30.0%
2	85	14.2%
3	39	6.5%
Total	597	100.0%

Table 7: Score of patients as per Migraine ID Questionnaire.

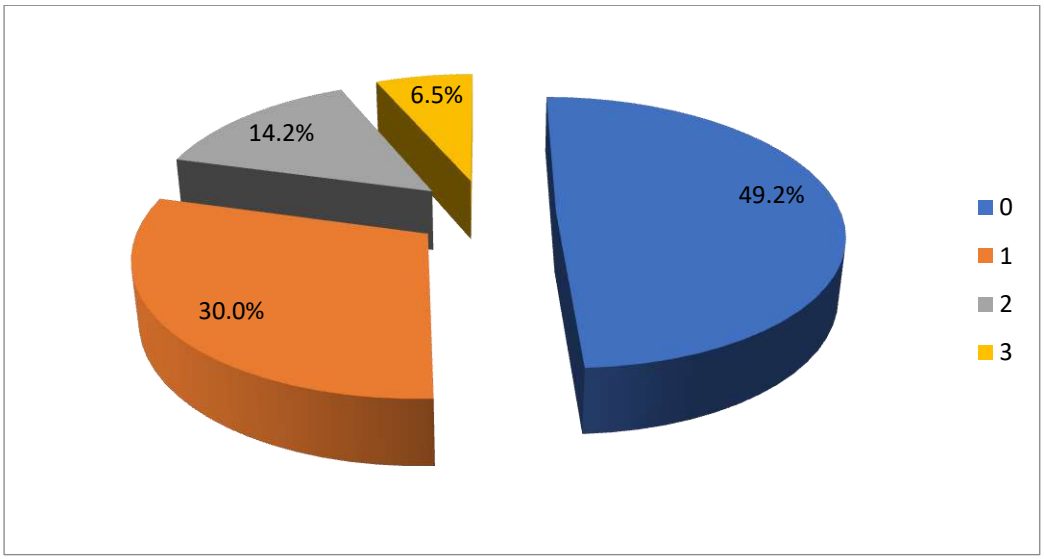


Figure 6: Score of patients as per Migraine ID Questionnaire.

The combined score for all the three questions on the ID-Migraine questionnaire varied from 0-3. Of all the 597 patients, almost half of them (294/597; 49.2%) had score 0, 179 (30.0%) had score 1, 85 (14.2%) had score 2 and 39 (6.5%) had total score of 3.

Migraine Diagnosis

Migraine	No. of cases	Percentage
No	473	79.2%
Yes	124	20.8%
Total	597	100.0%

Table 8: Classification of patients as per Migraine diagnosis.

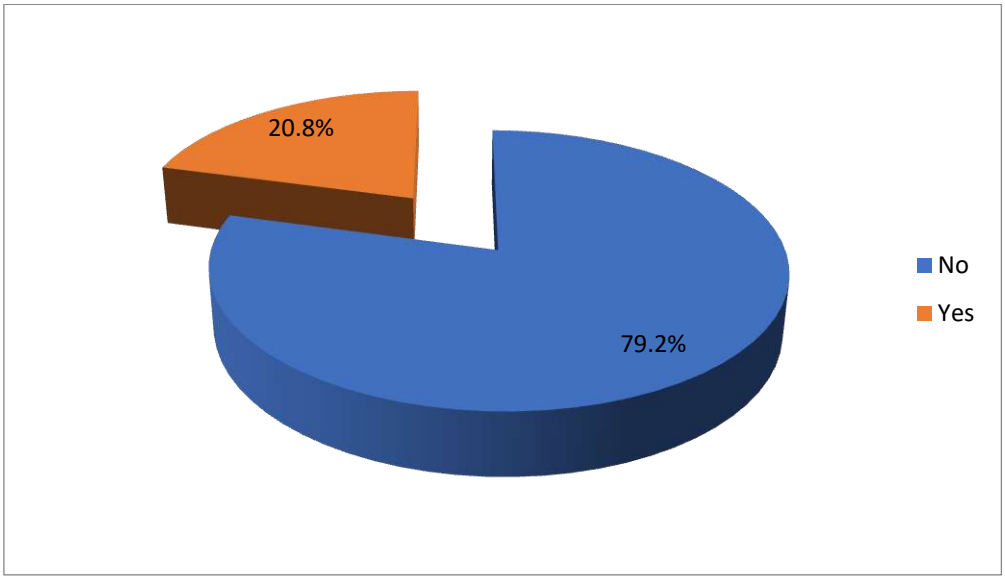


Figure 7: Classification of patients as per Migraine diagnosis.

Based on Migraine ID Questionnaire, patients were classified as having migraine if total score was ≥2. Of total 597 patients, 124 (20.8%) were found to have already pre-existing migraine. Classification based on presence or absence of aura was not done in this study.

Family History

Is there any family history of migrainous headache ?	No. of cases	Percentage
No	477	79.9%
Yes	120	20.1%
Total	597	100.0%

Table 9: Family history of migraine in patients studied.

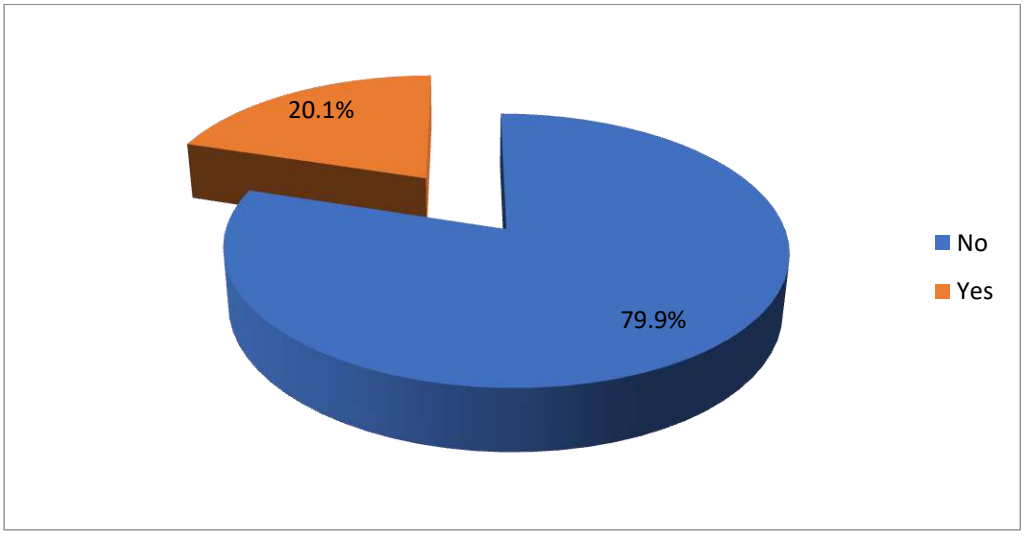


Figure 8: Family history of migraine in patients studied.

Family history of migraine was found to be positive in 20.1% (120/597) of patients enrolled in the study. The other 79.9% of patients did not have any family history of migraine.

If answer to previous question is 'Yes', kindly specify in whom ?	No. of cases	Percentage
Brother	9	7.4%
Daughter	3	2.5%
Father	19	15.7%
Mother	57	47.1%
Others	18	14.9%
Sister	11	9.1%
Son	4	3.3%
Total	121	100.0%

Table 10: Family member of the patients having migraine.

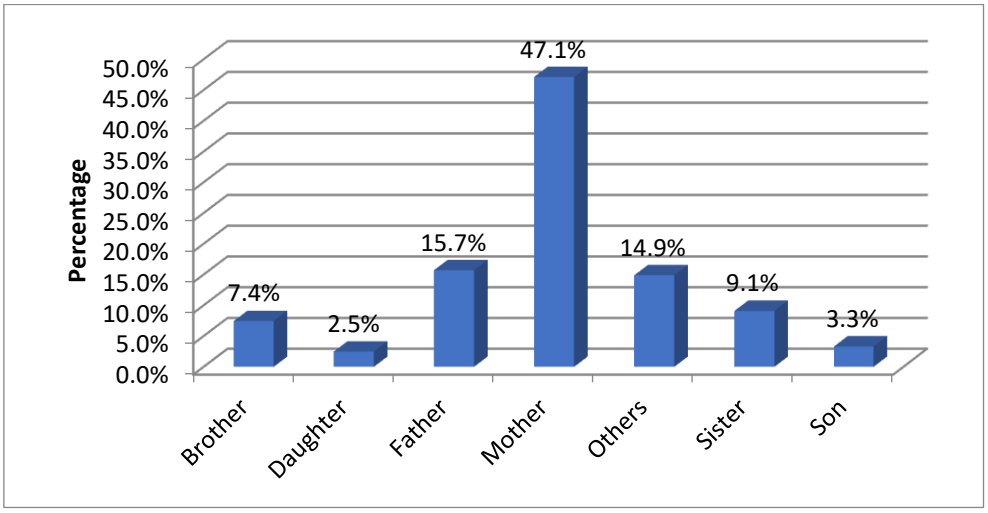


Figure 9: Family member of the patients having migraine.

Out of the patients who had positive family history of migraine, mother was the most common family member suffering from migraine (47.1%; 57/121), followed by father (15.7%; 19/121). Family history in second degree relatives (Others) was found to be 14.9% (18/121).

HEADACHE POST EEG/ IPS

Headache in 3 days of EEG/IPS-

Was there any headache in last 3 days ?	No. of cases	Percentage
No	469	94.9%
Yes	25	5.1%
Total	494	100.0%

Table 11: Patients having headache within 3 days following EEG with IPS.

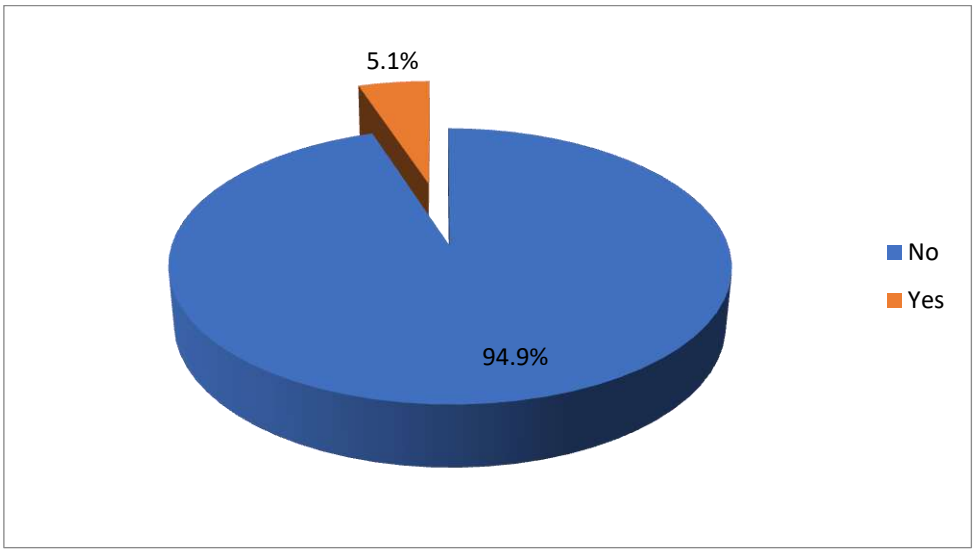


Figure 10: Patients having headache within 3 days following EEG with IPS.

In the POST EEG Online Questionnaire, which was filled by patients at home after 72 hours of EEG with Intermittent photic stimulation, only 5.1% (25/494) patients reported to have had headache in last 3 days.

Duration of headache-

Duration of headache ?	No. of cases	Percentage
Days	2	5.4%
Hours	9	24.3%
Minutes	18	48.6%
No	8	21.6%
Total	37	100.0%

Table 12: Duration of headache in patients after EEG with IPS.

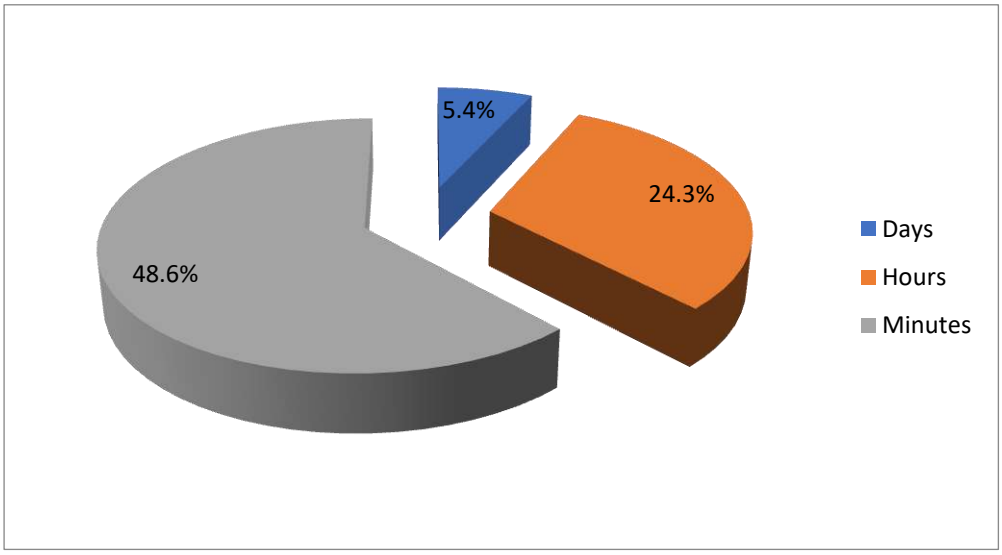


Table 11: Duration of headache in patients after EEG with IPS.

The duration of headache for was mostly in minutes for 48.6% of patients, whereas it was in hours for 24.3% of patients and 5.4% of patients had headache lasting for 1 or more days.

Have you ever experienced similar kind of headache before ?	No. of cases	Percentage
No	458	93.3%
Yes	33	6.7%
Total	491	100.0%

Table 13: Patients having faced similar type of headache before.

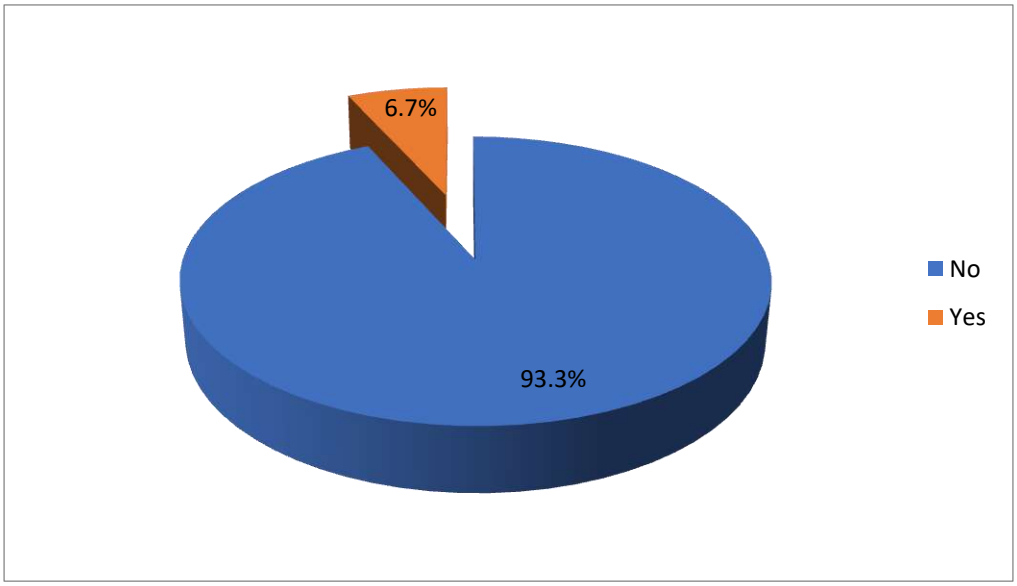


Figure 12: Patients having faced similar type of headache before.

In this study, 33/491 (6.7%) of patients reported that they have had earlier also faced similar kind of headache, the one they had after EEG with IPS.

Severity of headache

What was the severity of headache ?	No. of cases	Percentage
0	16	30.8%
1	1	1.9%
2	13	25.0%
4	8	15.4%
6	5	9.6%
8	4	7.7%
10	2	3.8%
No	3	5.8%
Total	52	100.0%

Table 14: Severity of headache after EEG with IPS.

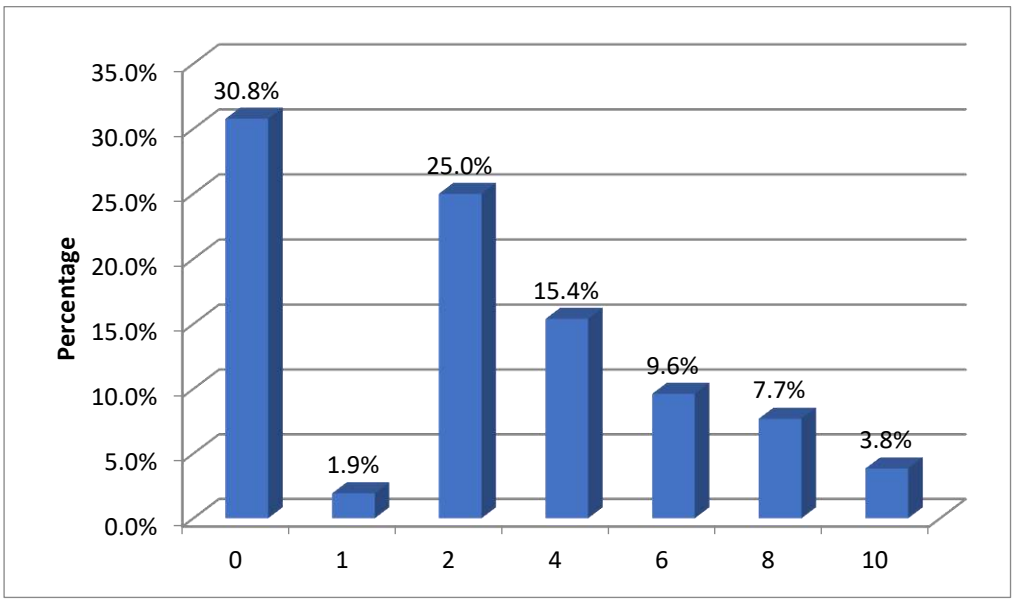


Figure 13: Severity of headache after EEG with IPS.

In context of severity of headache POST EEG/IPS, based on VAS scoring, 30.8% of patients had minimal severity with the score of 0. The

headache was mainly mild only as almost 70% of patients had their severity score in the range of 0-4.

Was the onset of headache after EEG test ?	No. of cases	Percentage
No	479	97.2%
Yes	14	2.8%
Total	493	100.0%

Table 15: Onset of headache after EEG test.

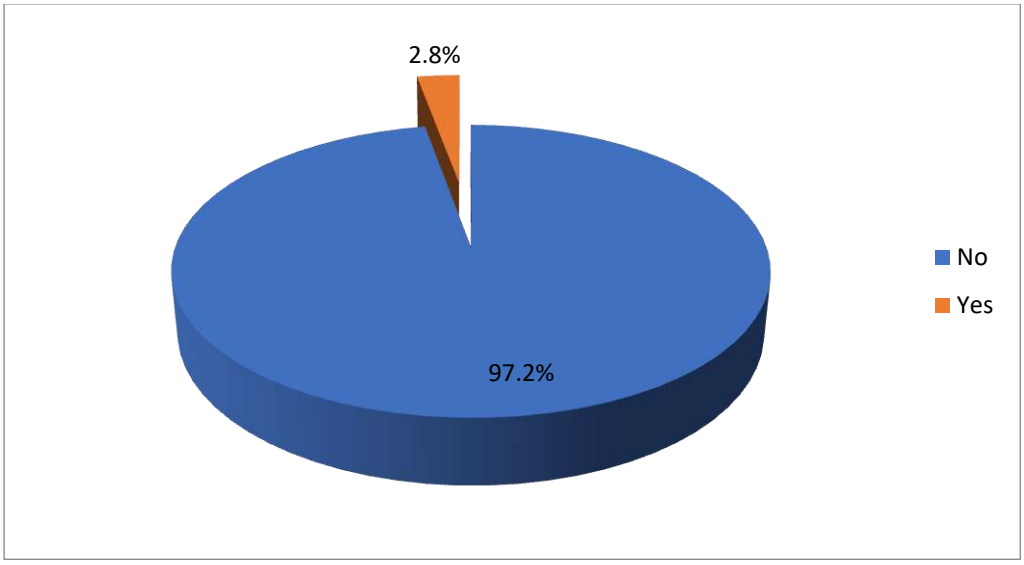


Figure 14: Onset of headache after EEG test.

The onset of headache, immediately after the EEG test was noticed in total of 14/494 patients (2.8%) only. This percentage is lower as compared to 5.1% in patients having headache up to 3 days after EEG/IPS. Likely explanation for this finding is that the patients must travel back to their respective homes also, and they might be having sleep deprivation also in view of transportation related uneasiness, and many other environmental factors, which perhaps might have been the reason for headache in some patients, exact proportion of which was not calculated in our study.

Did you require any medicine for relief from headache ?	No. of cases	Percentage
No	465	94.3%
Yes	28	5.7%
Total	493	100.0%

Table 16: Patients requiring medications for headache relief.

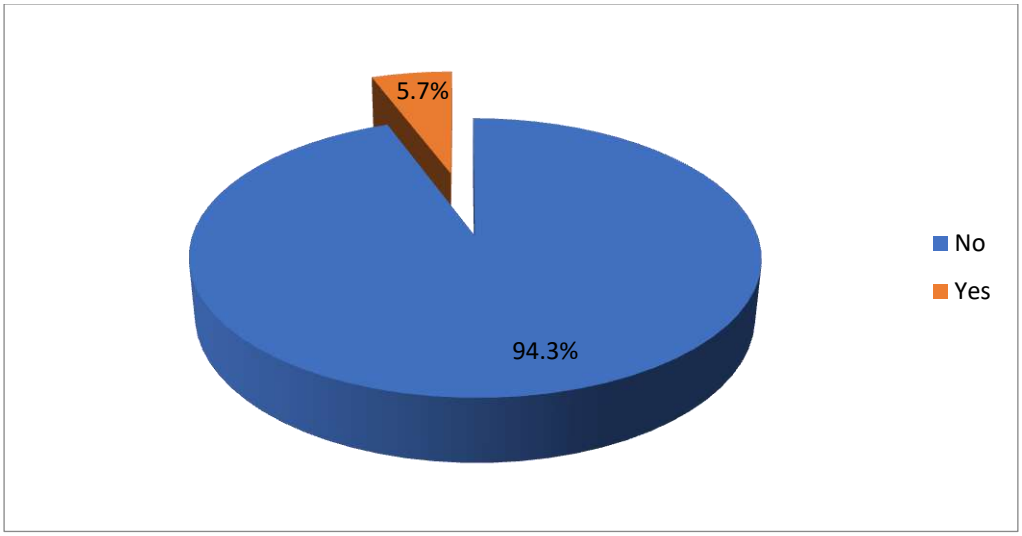


Figure 15: Patients requiring medications for headache relief.

5.7% (28/494) of patients, who filled up the POST EEG forms, and had headache after the EEG test, required medication for relief from their headache.

		Sex			Total	Chi-square value	p-value
		Female	Male	Transgender			
AGE GROUP	<20	76	110	1	187	3.869	0.694
	21-40	125	156	0	281		
	41-60	50	55	0	105		
	>60	12	12	0	24		
Total		263	333	1	597		

Table 17: Distribution of patients based on the sex and age.

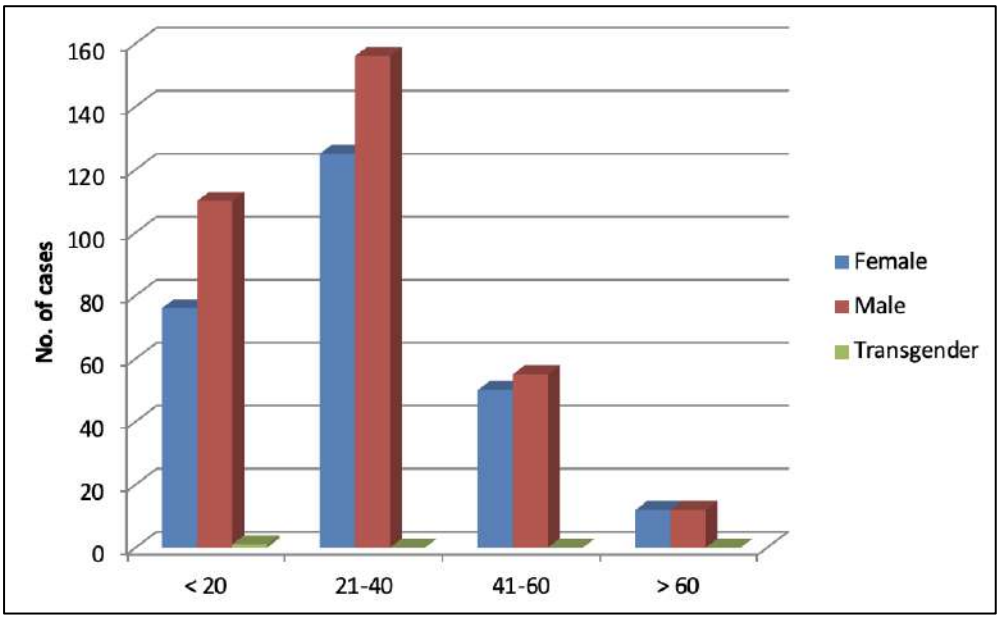


Figure 16: Distribution of patients based on the sex and age.

In the result analysis, the most common age group of patients enrolled was of 21-40 years of age (281/597), followed by 8-20 years age group (187/597) (<20 years), then 41-60 years (105/597) , and lastly , the age group of > 60 years (24/597). In all these age groups, we can clearly see that our study had more male patients in each respective age group, the ratio being almost comparable in each group, with p value being 0.694 (statistically not significant).

		Was there any headache in last 3 days ?		Total	Chi-square value	p-value
		No	Yes			
Migraine	No	379	12	391	15.451	0.001
	Yes	90	13	103		
Total		469	25	494		

Table 18: Relation of patients with past history of migraine and those having headache after EEG/IPS.

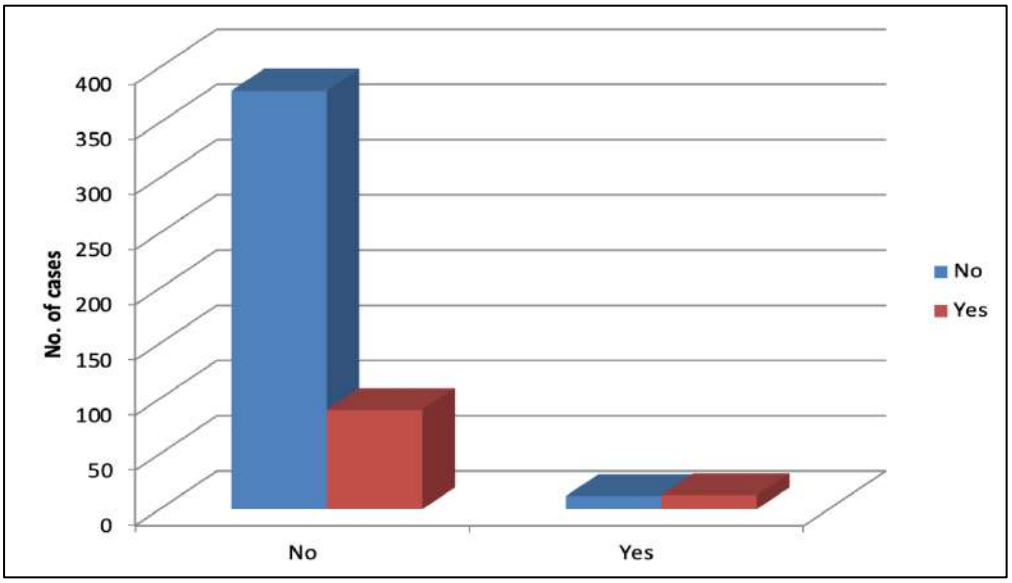


Figure 17: Relation of patients with past history of migraine and those having headache after EEG/IPS.

We found that, in patients who reported to have had headache up to 3 days after the EEG/IPS (25/494), out of these 25 patients, the ratio of patients having past history of migraine, irrespective of headache after the EEG/IPS was much higher (13/103) as compared to those who didn't have past history of migraine(12/391), making it statically significant with p value of 0.001. Odd's ratio was 3.58.Thus, patients having previous history of migraine attacks were found to be at higher risk of having headaches after EEG/IPS in our study.

				Total	Chi-square value	p-value
		No	Yes			
Is there any family of migrainous headache?	No	373	13	386		
	Yes	96	12	108	10.509	0.002
Total		469	25	494		

Table 19:Relation of patients with family history of migraine and those having headache after EEG/IPS.

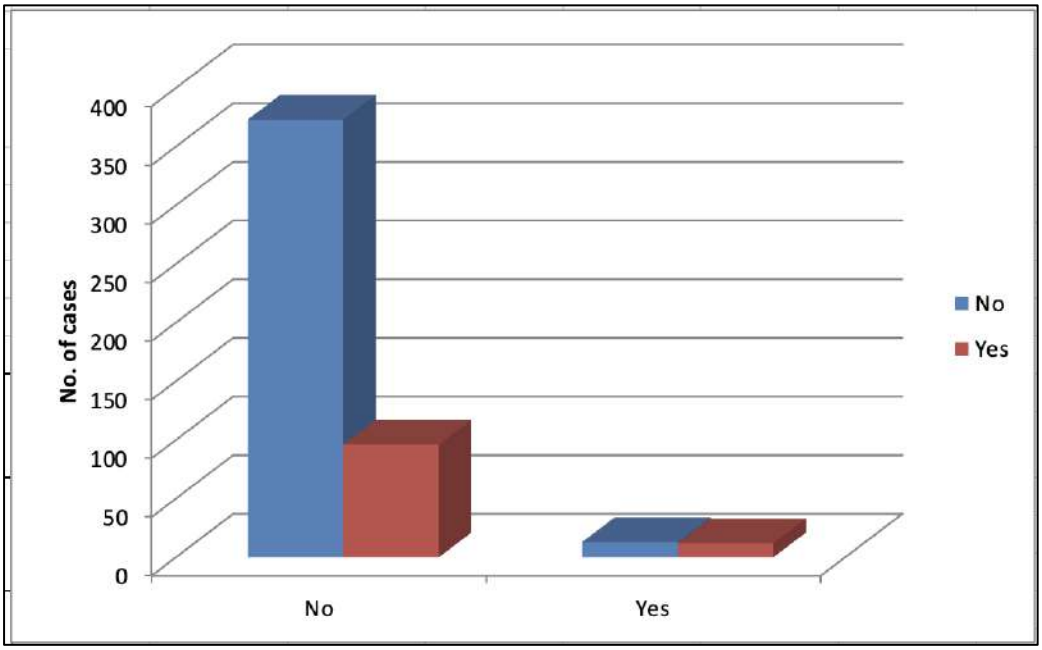


Figure 18: Relation of patients with family history of migraine and those having headache after EEG/IPS.

In patients who reported to have had headache up to 3 days after the EEG/IPS (25/494), out of these 25 patients, the ratio of patients having family history of migraine, irrespective of headache after the EEG/IPS was much higher (12/96) as compared to those who didn't have family history of migraine (13/373), making it statically significant with p value of 0.002. Odd's ratio was 3.76. Thus, patients having family history of migraine were found to be at higher risk of having headaches after EEG/IPS in our study.

		No migraine				Total	Chi-square value	p-value
		No. of cases	No migraine	No. of cases	Migraine			
Is there family of migrainous headache?	No	390	82.5%	87	70.2%	477	9.241	0.002
	Yes	83	17.5%	37	29.8%	120		
Total		473	100.0%	124	100.0%	597		
If answer to previous question is 'Yes' kindly specify in whom?		388	82.0%	88	71.0%	476	12.516	0.085
	Brother	6	1.3%	3	2.4%	9		
	Daughter	3	0.6%	0	0.0%	3		
	Father	13	2.7%	6	4.8%	19		
	Mother	38	8.0%	19	15.3%	57		
	Others	15	3.2%	3	2.4%	18		
	Sister	8	1.7%	3	2.4%	11		
	Son	2	0.4%	2	1.6%	4		
Total		473	100.0%	124	100.0%	597		

Table 20: Relation of past history of migraine in patients studied with their respective family history of migraine.

In patients with history of migrainous headaches in the past, (n=124),(Table 20) in relation to their family history, the latter was seen in 37/120 cases as compared to 87/477 patients with absent family history in patients with past history of migraine, making it statically significant with p value of 0.002. (Figure 19).

Amongst family members involved in family history, the most common member having history of migraine was mother (57/597), (Table 20) followed by father (19/597), followed by 2nd degree relatives. This family member distribution of migraine history was statistically insignificant (p value of 0.085.) (Figure 20)

		No Migraine		Migraine		Total	Chi-square value	p-value
		No. of cases	No Migraine	No. of cases	Migraine			
Was there any headache in last 3 days?	No	379	96.9%	90	70.3%	469	15.451	0.001
	Yes	12						
Total		391						
Duration of headache?	Days	0	0.0%	2	14.3%	52	2.301	0.316
	Hours	5	3.2%	4	28.6%	9		
	Minutes	10	6.4%	8	57.1%	18		
Total		15	9.6%	14	100.0%	79		
Have you evef experienced similar kimd of headache before?	No	367	94.3%	91	89.2%	458	3.384	0.065
	Yes	22	5.7%	11	10.8%	33		
Total		389	100.0%	102	100.0%	491		
Was the onset of headache after EEG test?	No	383	98.2%	95	93.1%	478	7.496	0.006
	Yes	7	1.8%	7	6.9%	14		
Total		390	100.0%	102	100.0%	492		
Did you require any medicine for relief from headache?	No	375	96.2%	90	87.4%	465	11.688	0.001
	Yes	15	3.8%	13	12.6%	28		
Total		390	100.0%	103	100.0%	493		

Table 21: Relation of past history of migraine of patients studied with post EEG/IPS headache and its characters.

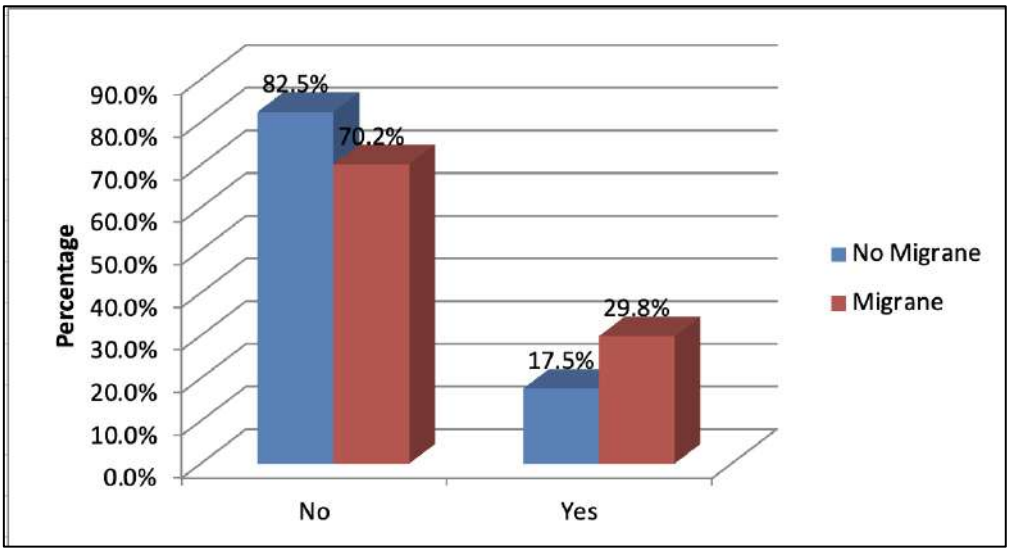


Figure 19:Relation of patients with family history of migraine and past history of migraine in patients studied.

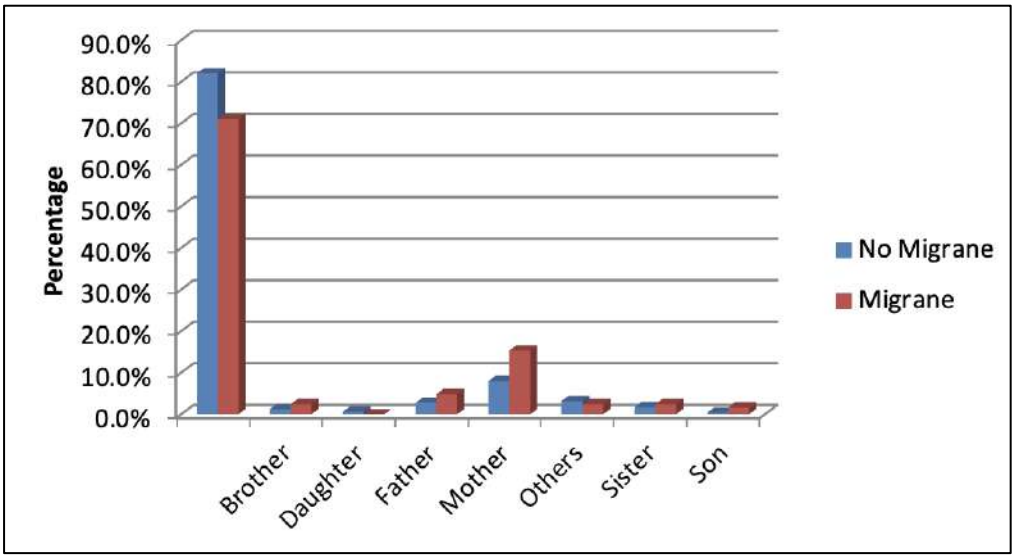
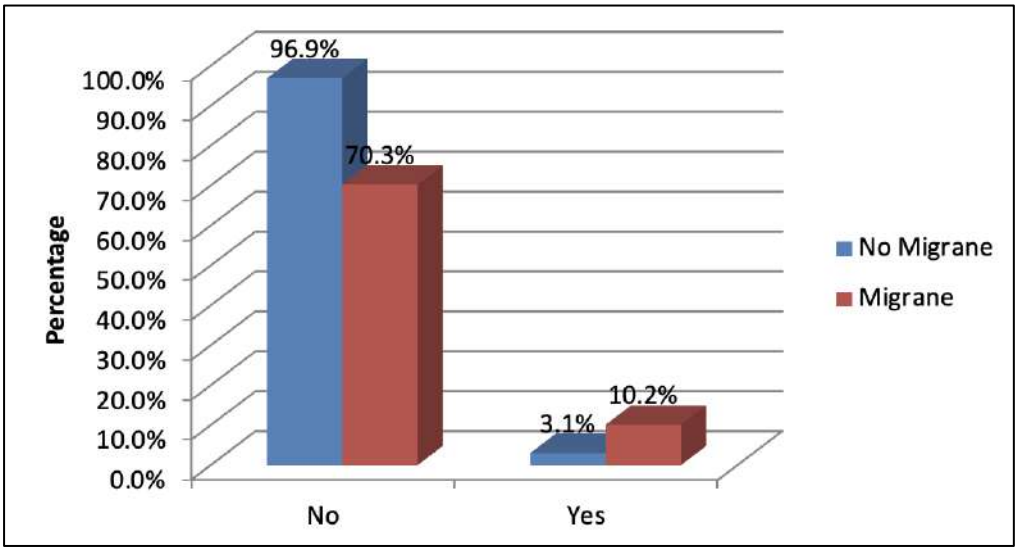


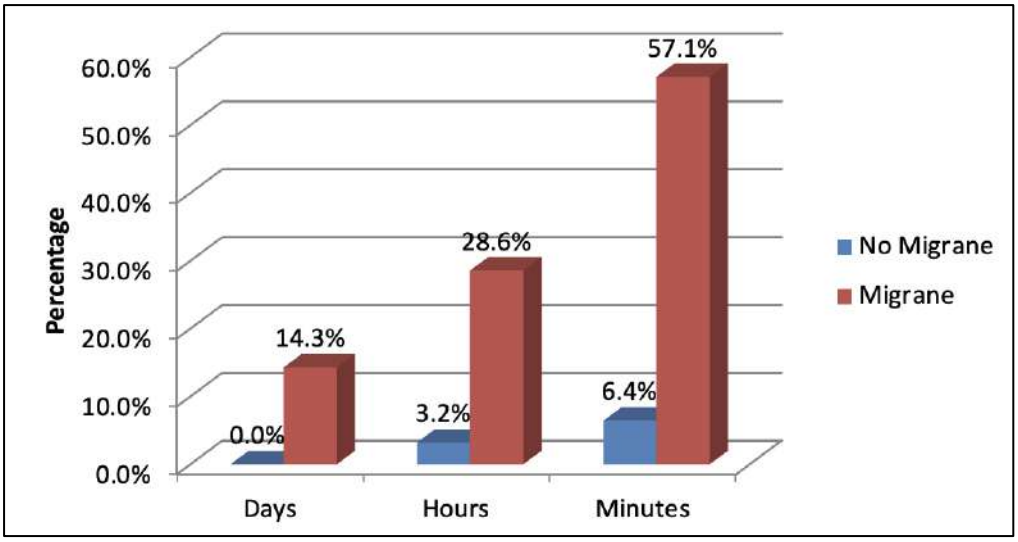
Figure 20:Relation of patients with family history of migraine (family member having migraine) and past history of migraine in patients studied.



Headache in last 3 days.

Figure 21: Relation of past history of migraine in patients studied with headache occurring after EEG/IPS test.

We found that, in patients who reported to have had headache up to 3 days after the EEG/IPS (25/494), out of these 25 patients, the ratio of patients having past history of migraine, irrespective of headache after the EEG/IPS was much higher (13/103) as compared to those who didn't have past history of migraine (12/391), (Table 21, Figure 21) making it statically significant with p value of 0.001. (Figure 21). Thus, patients having previous history of migraine attacks were found to be at higher risk of having headaches after EEG/IPS in our study.



Duration of headache after EEG/IPS test.

Figure 22: Relation of past history of migraine in patients studied with duration of headache occurring after EEG/IPS test.

We found that in patients having headache after EEG/IPS, the duration of headache was seen in hours in 28.6% of patients, in minutes in 57.1% of patients, and for days in 14.3% of patients. The p value was statistically insignificant. (0.316)

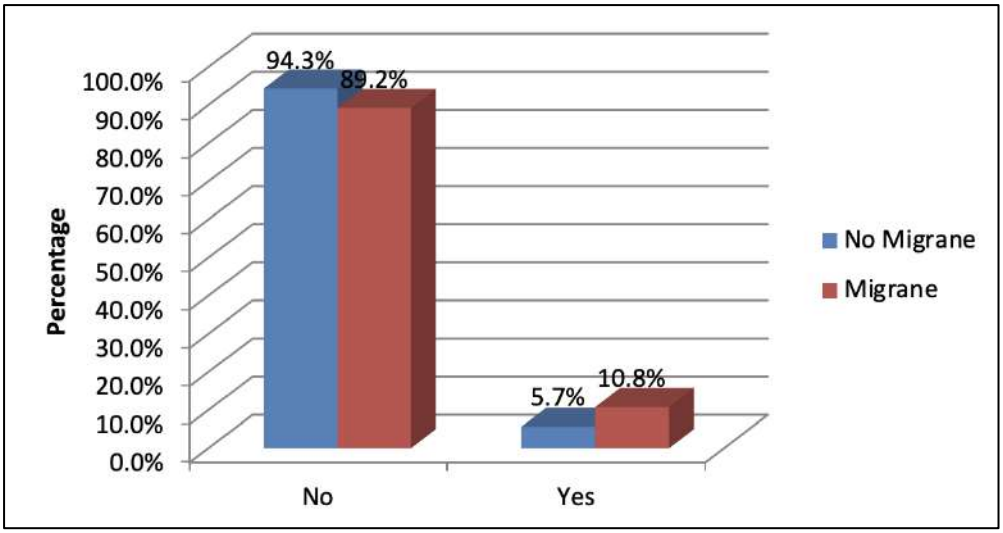


Figure 23: Relation of past history of migraine in patients studied with similar kind of headache experienced in the past, occurring after EEG/IPS test.

We, in our study, found that patients who experienced headache after EEG/IPS, the p value was found statically insignificant (0.065) regarding past history of migraine and similar type of headache occurring in patients after EEG/IPS test.

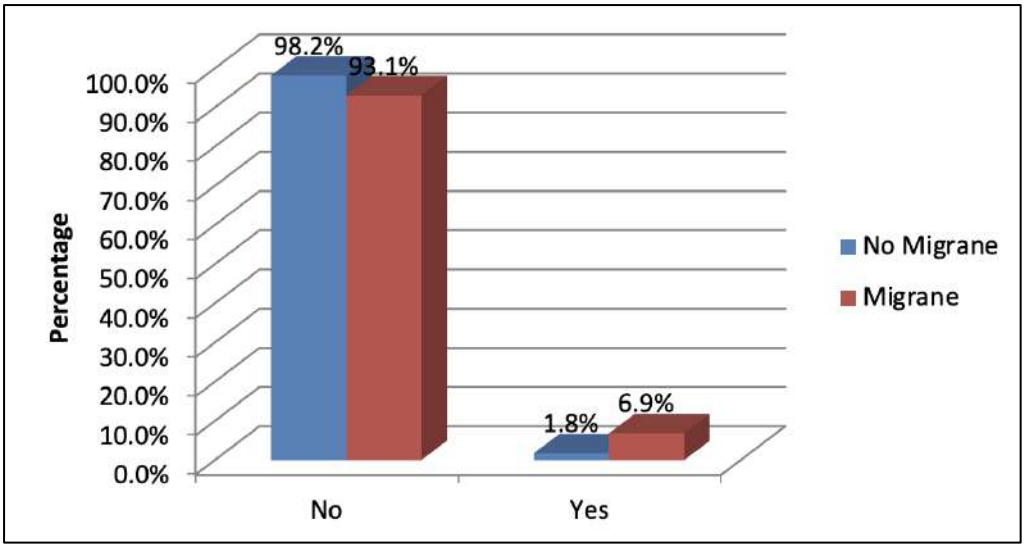


Figure 24:Relation of past history of migraine in patients studied with occurrence of headache immediately after EEG/IPS test.

The onset of headache, immediately after the EEG test was noticed in total of 14/494 patients (2.8%) only. When this was analyzed in respect of past history of migraine in patients who suffered headache immediately, post EEG/IPS, p value was found to be 0.006. This is in contrast to the results of patients experiencing headache within 3 days post EEG/IPS, where p value was found to be 0.001.

DISCUSSION

This study was conducted to study the prevalence of headache amongst patients after EEG with intermittent photic stimulation (IPS), and to test whether IPS acts as a precipitating or a trigger factor for migraine like headache. We also aimed to look into the correlation between past history and family history of migraine in patients studied, who complained of headache after the above-mentioned test. It was a hospital-based hypothesis generational study, with the hypothesis being that IPS acts as a precipitating factor for migraine.

A total of 597 patients were enrolled in this study over a period of 15 months (1st December,2022 to 1st March, 2024) who underwent EEG with IPS in EEG Lab, Department of Neurology, Dayanand Medical College and Hospital, Ludhiana. Out of the total of 597 patients who filled up the PRE EEG form (patient preferred language – English / Hindi / Punjabi), 494 patients filled up the POST EEG form, after 72 hours of EEG, accounting for follow up rate of 82.7%. In the meta-analysis done by Meng-Jia Wu *et al* (2022),online survey response rate was found to be 44.1%. It was observed that sending surveys to a well-defined and refined set of population or patients had a positive impact on the online survey response rate. Also, using phone calls, as was done in our study, to remind patients about the online form filling after 72 hours, resulted in an increased response rate.[114]

Firstly, regarding demographic patterns, amongst 597 patients enrolled in this study, 55.8% (333/597) were male patients, 44.1% (263/597) were female patients, and one patient was transgender. The most common age group of patients enrolled was of 21-40 years of age (281/597), followed by 8-20 years age group (187/597) (<20 years), then 41-60 years (105/597), and lastly, the age group of > 60 years (24/597). In all these age groups, we can clearly see that our study had more male patients in each respective age group, the ratio being almost comparable in each group, with p value being 0.694 (statistically

not significant). Hence, majority of patients who underwent EEG in our study was young adults and adolescents.

Out of the 3 ID-Migraine Questionnaire questions,33.0% patients responded “Yes” to the 1st question 19.4% responded “Yes” to the 2nd question and 25.6% said “Yes” to the 3rd question. In the original study by Lipton RB also, majority of patients i.e. 77% scored positive on Question-1 of ID-Migraine questionnaire and 43% patients scored positive for all three questions.On combining all of the three ID-Migraine Questionnaire scores, 294/597 patients (49.2%) scored 0,whereas 30% (n=179) of patients had a score of 1, 14.2% (n=85) had score of 2, 6.5% (n=39) had total score of 3.Based on ID-Migraine Questionnaire, patients were classified as having migraine if total score was ≥2. This was also based on the original study by Lipton RB.[112] As a result, 20.8% (124/597) patients were found to have migraine. Classification based on presence or absence of aura was not done in this study.

The global age-standardized prevalence of migraine was reported to be 14·4% (13·8–15·0) overall in the Global Burden of Disease Study of 2016; 18·9% (18·1–19·7) for women and 9·8% (9·4–10·2) for men.[59]

With regards to Indian population, research conducted in Karnataka in 2015 found that the age-standardized 1-year prevalence of migraine was 25.2%. Prevalence of migraine was found to be greater in women than in males (OR: 2.1 [1.7-2.6]) and in rural as opposed to urban regions (OR = 1.5 [1.3-1.8]).A study conducted in Urban Kolkata reported 1-year prevalence of migraine to be 14.1% (95% CI: 12.7-15.6). It was also observed that women had much higher overall DALY (maximum in age group 30-34 years) in comparison to men per 100000 (7209 versus 2140).The 1-year prevalence of migraine was found to be 27.2% in epidemiological research conducted in Delhi, comprising both rural and urban regions. Overall, these findings indicate that primary headaches are as common in India as they are in Western countries, if

not more so. However, more accurate epidemiological data is required to accurately estimate the headache burden.[115]

In this study, family history of migraine was found to be positive in 20.1% (120/597) of patients enrolled.In the meta-analysis study regarding the heritability of human traits by Polderman TJ *et al* , the estimated inheritance of migraine was found to have a range from 35% to 60%. The relative risk of migraine for a first-degree relative of an index case was found to be 1.5- to 4-fold in comparison with the general population.[116]
The heritability of migraine has been estimated by many additional studies to be around 42%. It further supported the theory that migraine is a complex disease brought on by interactions between genes themselves and their surroundings, and maybe unidentified variables.[116]

Pelzer N *et al* reported that migraine frequency, which was defined as the number of days a patient suffers from migraine in one month, was associated with a genetic propensity exclusively in men. Family history of migraine was found to have strong association with a higher number of medication days, a lower age-at-onset, and migraine with aura.[117]Similar association of migraine with family history was observed by de Boer I *et al.*[118]According to the Stevenson SB, migraine prevalence was greater in people with epilepsy (14.7%) than in the general population (2.7% - 11%). While 20.6% of respondents had a positive family history of epilepsy, only 4.7% reported to have family history of migraine, corroborating current theories about the genetic genesis of various epilepsies. The focus of this study was children with epilepsy and migraine, but each time a primary diagnosis is established, it is important to look into the possibility of other coexisting disease.[119]

In patients with history of migrainous headaches, (n=124) in relation to their family history, the latter was seen in 37/120 cases as compared to

87/477 patients with absent family history in patients with past history of migraine, making it statically significant with p value of 0.002.Amongst family members involved in family history, the most common member having history of migraine was mother (57/597), followed by father (19/597), followed by 2nd degree relatives (18/121). This family member distribution of migraine history was statically insignificant (p value of 0.085).

When comparing family history reports of migraine to direct interviews, Lateef TM *et al* (2015) discovered that the sensitivity and specificity of former were 38.6% and 96.8%, respectively, suggesting that the false negative rate was substantial, while the false positive rate was quite low.
The family member report's positive and negative predictive values for the diagnosis of migraine were 90.0% and 67.6%, respectively.
Their findings supported the notion that migraine assessment by family member report significantly understated migraine in relatives and showed the importance of conducting direct interviews with relatives instead of depending solely on family history reports in clinical practice and genetic and family studies.[120]

Hence, in the PRE EEG forms analysis, we concluded that 55.8% were male patients, 44.1% were female patients, and one transgender patient. The most common age group of patients enrolled was of 21-40 years of age. The prevalence of migraine was seen in 20.8%, and family history of migraine in 20.1% of patients enrolled in the study. After filling up the PRE EEG forms, patients had to fill up POST EEG forms after 72 hours of the EEG/IPS test.

In the POST EEG Online Questionnaire, which was filled by patients at home after 72 hours of EEG with IPS, only 5.1% (25/494) patients reported to have had headache in last 3 days. The onset of headache, immediately after the EEG test was noticed in total of 14/494 patients

(2.8%) only. This percentage is lower as compared to 5.1% in patients having headache up to 3 days after EEG/IPS. The likely explanation for this result was that the patients must travel back to their respective homes also, and they might be having sleep deprivation also in view of transportation related uneasiness, (being a tertiary referral center, patients come from nearby states also) and many other environmental and socio-economical factors, which perhaps might have been the reason for headache in some patients, exact proportion of which was not calculated in our study.

In context of severity of headache post EEG/IPS, based on VAS scoring, 30.8% of patients had minimal severity with the score of 0. The headache was mainly mild only as almost 70% of patients had their severity score in the range of 0-4. Also, the duration of headache was mostly in minutes for 48.6% of patients, whereas it was in hours for 24.3% of patients and 5.4% of patients had headache lasting for 1 or more days.

Thus, the headache occurring in patients after EEG/IPS was of very mild intensity only, lasting only for minutes, as compared to migraine which usually lasts at least 3-4 hours.

We found that, in patients who reported to have had headache up to 3 days after the EEG/IPS (25/494), out of these 25 patients, the ratio of patients having past history of migraine, irrespective of headache after the EEG/IPS was much higher (13/103) as compared to those who didn't have past history of migraine (12/391), making it statically significant with p value of 0.001. Thus, patients having previous history of migraine attacks were found to be at higher risk of having headaches after EEG/IPS in our study. Also, 33/491 (6.7%) of patients reported that they have had earlier also faced similar kind of headache, the one they had after EEG with IPS.

Although migraine and epilepsy have several pathophysiological similarities, it is uncommon for migraine to be the sole ictal manifestation of epilepsy or to directly trigger an epileptic episode. This is because the threshold for initiating a migraine is generally much

lower than that required to induce a seizure.[19]According to reports, the prevalence of epilepsy among people who have migraines ranges from 1 to 17% overall, with a median of 5.9%. This is greater than the 0.5 to 1% prevalence seen in the general population.[37]

Strong evidence was presented by Toldo *et al (2010)*[31] linking migraine and epilepsy, reporting a 3.2-fold increased incidence of epilepsy in migraineurs compared to patients with tension-type headaches, with finding no discernible difference between migraine with and without aura. In instances with comorbidity, focal epilepsies predominated (76.8%). The prevalence of cryptogenic epilepsy (75%) was three times higher in migraineurs with focal epilepsies (36/56) than in those with idiopathic epilepsy (25%).

In our study, patients who reported to have had headache up to 3 days after the EEG/IPS (25/494), out of these 25 patients, the ratio of patients having family history of migraine, irrespective of headache after the EEG/IPS was much higher (12/96) as compared to those who didn't have family history of migraine (13/373), making it statically significant with p value of 0.002. Thus, patients having family history of migraine had increased likelihood of having headache after EEG/IPS in our study. Various studies have highlighted that the chances of an ictal or epileptic headache are much higher when both epilepsy and migraine tend to occur in the same family.[69, 70]

We found that, in patients who reported to have had headache up to 3 days after the EEG/IPS (25/494), out of these 25 patients, the ratio of patients having past history of migraine, irrespective of headache after the EEG/IPS was much higher (13/103) as compared to those who didn't have past history of migraine (12/391), making it statically significant with p value of 0.001. Thus, patients having previous history of migraine attacks were found to be at higher risk of having headaches after EEG/IPS in our study.

The limitations of our study need a mention also. Firstly, indication of patients undergoing EEG was not included in our study. Second, the EEG changes pre and post IPS were not recorded and documented in

our study, which could have made a difference to our results, as there is a high possibility that patients who had PPR during IPS might have had increased incidence of post EEG/IPS headaches as compared to those whose EEG didn't show any changes. Third, it's a hypothesis-based study, hence future studies are needed for further validation of our hypothesis and the research question.

In conclusion, our study tried to decipher whether intermittent photic stimulation acts as a precipitating factor or a trigger for migraine. The hypothesis was that intermittent photic stimulation should act as a trigger for migraine. The results of this study conclude that 2.8 % of patients who underwent EEG/IPS, for whatsoever indication, reported to have headache, immediately after the test. Patients who had history of migraine attacks in the past, as well as those having family history of migraine, were at higher risk of having headaches after IPS. This study has practical implications in the sense that, if future studies are conducted which include EEG findings along with, and if we can prove the headache is post-ictal, or just an epileptic headache, we can offer them treatment options in the form of antiseizure medications, rather than antimigraine drugs.

SUMMARY AND CONCLUSIONS

This study aimed to evaluate the prevalence of headaches and their characteristics following Intermittent Photic Stimulation (IPS) during EEG tests. The primary objective was to investigate if IPS acts as a trigger for migraine in patients undergoing EEG. Additionally, the study sought to assess the influence of patients' past and family histories of migraine on their likelihood of experiencing headaches after IPS. The study was conducted on 597 patients, of which 494 completed all necessary forms and follow-ups, ensuring an 82.7% response rate.

The analysis of demographic data revealed that most of the study participants were males (55.8%), and the predominant age group was 21-40 years (47.1%). The results demonstrated that 2.8% of the patients reported headaches immediately after undergoing the EEG/IPS procedure. Additionally, the study revealed that patients with a history of migraine (13/103) or a family history of migraine (12/96) had a statistically significant higher likelihood of developing headaches post-procedure compared to those without such histories.

The study has several limitations. It did not account for the reasons why patients were undergoing EEG, which could have impacted the outcomes. Moreover, the EEG results before and after IPS were not documented, which might have provided more insight into the relationship between EEG changes and headaches. Future studies are recommended to validate these findings by including EEG results and investigating whether post-EEG headaches are of epileptic or migrainous origin. If proven to be epileptic, such headaches may benefit from treatment with ASMS instead of antimigraine drugs.

In conclusion, this study suggests that IPS may act as a trigger for headaches, particularly in patients with a previous history of migraines or a family history of migraines. These findings could have practical implications in the management of post-EEG headaches, encouraging further research to optimize treatment approaches for affected patients.

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S No.	MRD No.	Initials	Timestamp	EEG ID	Age	AGE GROUP	Sex	Date	Has the headache limited your activities for a day or more in the last three months?	Are you nauseated / sick to your stomach when you have a headache?	Does light bother you when you have a headache?	SCORE	Migrane
1	15301	AS	45087.54043	1022	17	1	Female	10-06-23	0	0	0	0	0
2	33294	AS	45430.77867	875	23	2	Female	18-05-24	0	0	0	0	0
3	49653	Ak	45077.5383	967	30	2	Female	31-05-23	1	0	0	1	0
4	64945	Is	45021.497	616	27	2	Male	05-04-23	0	0	0	0	0
5	68675	Ds	45110.45684	1163	28	2	Male	03-07-23	0	0	0	0	0
6	104162	Sk	45367.56723	466	47	3	Female	16-03-24	1	0	0	1	0
7	113601	D	45056.61465	852	13	1	Male	10-05-23	0	0	0	0	0
8	113602	Dk	45059.6095	868	13	1	Male	10-05-23	0	0	0	0	0
9	114567	V	45070.67101	919	39	2	Female	24-05-23	1	0	0	1	0
10	116197	Aj	45070.67046	928	33	2	Female	24-05-23	1	0	1	2	1
11	126556	A	45050.50308	597	47	3	Male	04-05-23	0	0	1	1	0
12	134543	AJ	45070.67111	938	32	2	Female	24-05-23	1	0	1	2	1
13	195724	AK	45020.45917	605	40	2	Male	04-04-23	0	0	0	0	0
14	202598	SS	45057.50638	853	29	2	Male	21-08-93	0	0	1	1	0
15	207224	Sk	45106.53189	1155	29	2	Female	29-06-23	0	0	0	0	0
16	209595	RB	45008.51074	533	41	3	Female	23-03-23	0	0	0	0	0
17	222544	Hk	45101.41057	1112	8	1	Female	24-06-23	1	0	0	1	0
18	237526	P	45121.5266	1241	33	2	Female	14-07-23	1	1	1	3	1
19	244689	K	45054.40289	826	12	1	Female	08-05-23	1	1	0	2	1
20	267560	S	45132.58574	1291	23	2	Female	25-07-23	1	1	0	2	1
21	267663	S	45132.60479	1295	25	2	Female	25-07-23	0	1	1	2	1
22	273989	MK	45010.48733	548-2023	32	2	Female	25-03-23	0	0	0	0	0
23	302886	Dk	45119.51738	1221	20	1	Male	12-07-23	1	0	0	1	0
24	317030	Ag	45444.38497	957	31	2	Male	01-06-24	1	0	0	1	0
25	336894	Gm	45470.69438	1128	16	1	Male	16-03-07	0	0	0	0	0
26	340469	Sg	45055.49486	840	53	3	Male	09-05-23	0	0	0	0	0
27	352817	DS	45008.55784	536-2023	31	2	Male	23-03-23	1	1	1	3	1
28	361010	GK	45357.60606	413	21	2	Female	06-03-24	0	1	1	2	1
29	369599	RS	45051.5961	1812	61	4	Female	05-05-23	1	0	0	1	0
30	445040	N	45026.47119	660	33	2	Female	10-04-23	0	0	0	0	0
31	446736	Hk	45451.62449	1002	23	2	Female	08-06-24	0	1	0	1	0
32	521592	RJ	45449.66847	991	13	1	Male	06-06-24	0	0	0	0	0
33	567234	AJ	45026.48068	653-2023	28	2	Male	10-04-23	0	0	0	0	0
34	567985	Ak	45026.47656	666	28	2	Male	10-04-23	0	0	0	0	0
35	567988	Aj	45024.60293	653	28	2	Male	08-04-23	0	0	0	0	0
36	578360	VV	45042.50961	7502023	16	1	Male	07-04-23	0	0	0	0	0
37	580012	Hs	45449.54274	988	36	2	Male	06-06-24	1	0	1	2	1
38	598854	Hs	45472.52797	1137	22	2	Male	29-06-24	0	0	0	0	0
39	600506	AS	45028.43691	674-2023	20	1	Male	12-04-23	1	1	0	2	1
40	631481	GK	45310.928	112	28	2	Male	19-01-24	0	0	0	0	0
41	667123	Rs	45050.49998	800	23	2	Male	04-05-23	0	1	1	2	1
42	706845	VK	45412.69089	758	27	2	Male	30-04-24	0	0	0	0	0
43	709675	SM	45469.55513	1113	29	2	Male	26-06-24	1	0	1	2	1
44	757686	Ak	45038.52148	734	56	3	Male	22-04-23	0	0	0	0	0
45	777889	R	45446.53888	-	16	1	Female	29-01-08	0	1	0	1	0
46	788170	Us	45195.60898	1735	36	2	Male	26-09-23	1	1	1	3	1
47	800444	Rs	45146.43299	1380	27	2	Male	08-08-23	0	0	0	0	0
48	802305	SKK	45446.39469	964	39	2	Male	03-06-24	0	0	0	0	0
49	812866	HKB	45447.73507	977	41	3	Male	07-03-83	0	0	0	0	0
50	837728	Ms	45110.44828	1161	33	2	Male	03-07-23	0	0	0	0	0
51	852869	Mv	45415.5553	775	18	1	Female	05-02-06	0	0	0	0	0
52	861831	RDS	45124.52924	1250	19	1	Male	15-07-23	1	1	0	2	1
53	864408	D	45386.494	605	14	1	Female	04-04-24	0	0	0	0	0
54	875159	K	45449.57108	989	42	3	Female	06-06-24	0	0	0	0	0
55	888680	Sj	45020.54506	610	79	4	Female	04-04-23	0	0	1	1	0
56	894646	As	45059.62176	870	66	4	Male	13-05-23	1	0	0	1	0

S No.	MRD No.	Initials	Is there any family history of migrainous headache ?	If answer to previous question is 'Yes', kindly specify in whom ?	Was there any headache in last 3 days ?	Duration of headache ?	Have you ever experienced similar kind of headache before ?	What was the severity of headache ?	Was the onset of headache after EEG test ?	Did you require any medicine for relief from headache ?
1	15301	AS	No	-	No	-	No	-	No	No
2	33294	AS	No	-	No	-	No	-	No	No
3	49653	Ak	No	-	No	-	No	-	No	No
4	64945	Is	No	-	No	-	No	-	No	No
5	68675	Ds	No	-	No	-	No	-	No	No
6	104162	Sk	No	-	No	-	No	-	No	No
7	113601	D	No	-	-	-	-	-	-	-
8	113602	Dk	No	-	-	-	-	-	-	-
9	114567	V	No	-	-	-	-	-	-	-
10	116197	Aj	Yes	Mother	No	-	No	-	No	No
11	126556	A	No	-	No	-	No	-	No	No
12	134543	AJ	No	-	-	-	-	-	-	-
13	195724	AK	No	-	No	-	No	-	No	No
14	202598	SS	No	-	No	-	No	-	No	No
15	207224	Sk	No	-	No	-	No	-	No	No
16	209595	RB	No	-	No	-	No	-	No	No
17	222544	Hk	No	-	No	-	-	-	-	-
18	237526	P	Yes	Mother	No	-	No	-	No	No
19	244689	K	No	-	-	-	-	-	-	-
20	267560	S	No	-	No	-	No	-	No	No
21	267663	S	No	-	No	-	No	-	No	No
22	273989	MK	No	-	No	-	No	-	No	No
23	302886	Dk	No	-	-	-	-	-	-	-
24	317030	Ag	Yes	Mother	No	-	No	-	No	No
25	336894	Gm	No	-	No	-	No	-	No	No
26	340469	Sg	No	-	-	-	-	-	-	-
27	352817	DS	Yes	-	-	-	-	-	-	-
28	361010	GK	No	-	No	-	No	-	No	No
29	369599	RS	No	-	No	-	No	-	No	No
30	445040	N	No	-	No	-	No	0	No	No
31	446736	Hk	No	-	No	-	No	-	No	No
32	521592	RJ	No	-	No	-	No	-	No	No
33	567234	AJ	No	-	No	-	No	-	No	No
34	567985	Ak	No	-	No	-	No	-	No	No
35	567988	Aj	Yes	Others	No	-	No	-	No	No
36	578360	VV	No	-	No	-	No	-	No	No
37	580012	Hs	No	-	No	-	No	-	No	No
38	598854	Hs	No	-	No	-	No	-	No	No
39	600506	AS	No	-	-	-	-	-	-	-
40	631481	GK	No	-	No	-	No	-	No	No
41	667123	Rs	No	-	-	-	-	-	-	-
42	706845	VK	No	-	No	-	No	-	No	No
43	709675	SM	No	-	No	-	No	-	No	No
44	757686	Ak	No	-	No	-	No	-	No	No
45	777889	R	Yes	Mother	No	-	No	-	No	No
46	788170	Us	No	-	No	-	No	No	No	No
47	800444	Rs	No	-	No	-	No	-	No	No
48	802305	SKK	No	-	No	-	No	-	No	No
49	812866	HKB	No	-	No	-	No	-	No	No
50	837728	Ms	No	-	No	-	Yes	0	No	Yes
51	852869	Mv	No	-	No	-	No	-	No	No
52	861831	RDS	No	-	No	-	No	-	No	Yes
53	864408	D	No	-	-	-	-	-	-	-
54	875159	K	No	-	No	Minutes	No	-	No	Yes
55	888680	Sj	No	-	No	-	Yes	0	No	No
56	894646	As	No	-	-	-	-	-	-	-

S No.	MRD No.	Initials	Timestamp	EEG ID	Age	AGE GROUP	Sex	Date	Has the headache limited your activities for a day or more in the last three months?	Are you nauseated / sick to your stomach when you have a headache?	Does light bother you when you have a headache?	SCORE	Migrane
57	896952	SS	45425.64922	839	39	2	Male	13-05-24	1	0	0	1	0
58	903169	S	45080.56625	982	27	2	Male	03-06-23	1	0	0	1	0
59	930578	GS	45086.94323	1078	13	1	Male	09-06-23	1	0	0	1	0
60	945863	JK	45101.36521	1111	17	1	Female	24-06-23	0	0	0	0	0
61	962325	L	45007.44425	523	10	1	Female	22-03-23	1	1	0	2	1
62	982296	Op	45145.76155	1374	72	4	Male	07-08-23	0	0	0	0	0
63	988641	MG	45148.46862	1398	17	1	Male	09-08-23	1	0	1	2	1
64	991751	DS	45038.52809	733	8	1	Male	22-04-23	0	0	0	0	0
65	1012130	Rk	45383.53846	589	33	2	Female	01-04-24	1	1	0	2	1
66	1018715	Sk	45272.55038	245	34	2	Female	12-12-23	0	1	0	1	0
67	1029805	K	45010.3938	546	20	1	Female	24-03-23	0	0	1	1	0
68	1083158	LSB	45096.60925	1090	18	1	Male	07-10-04	0	0	0	0	0
69	1085935	N	45020.51074	607	48	3	Female	04-04-23	1	0	0	1	0
70	1089345	HG	45022.42411	630	21	2	Male	06-04-23	0	0	1	1	0
71	1097879	As	45050.52204	801	13	1	Male	04-05-23	0	0	0	0	0
72	1124547	A	45369.62304	480	9	1	Male	18-03-24	1	1	0	2	1
73	1130242	AK	45101.67862	1117	31	2	Female	24-06-23	0	0	0	0	0
74	1133069	Gs	45154.54887	1431	17	1	Male	16-08-23	0	0	0	0	0
75	1185205	GS	45458.4514	043902425/2486	38	2	Male	14-06-24	1	0	0	1	0
76	1199335	Kk	45094.59716	1082	30	2	Female	17-06-23	1	1	1	3	1
77	1201172	JS	45442.44451	954	52	3	Male	30-05-24	0	0	0	0	0
78	1206577	M	45444.61926	960	36	2	Female	01-06-24	1	0	0	1	0
79	1210890	Mw	45471.49008	1130	12	1	Female	07-05-11	0	0	0	0	0
80	1227439	GSS	45426.56986	845	15	1	Male	14-05-24	0	0	0	0	0
81	1242262	PA	45423.586	827	14	1	Male	11-05-24	0	0	0	0	0
82	1247604	Ng	45048.36119	784	48	3	Male	02-05-23	0	0	0	0	0
83	1249808	J	45448.64507	983	18	1	Female	05-06-24	0	0	0	0	0
84	1258060	JSC	45441.62991	943	15	1	Male	29-05-24	0	0	0	0	0
85	1258305	Kk	45439.8386	883	67	4	Female	19-05-24	0	0	0	0	0
86	1260656	RR	45056.74998	855	87	4	Male	05-10-23	0	0	0	0	0
87	1265491	HK	45050.46721	797	47	3	Male	04-05-23	0	0	1	1	0
88	1269407	SG	45372.54411	516	16	1	Male	21-03-24	0	0	1	1	0
89	1277645	SJ	45056.49301	809	43	3	Female	10-05-23	0	0	0	0	0
90	1282346	R	45019.63149	589	63	4	Female	04-03-23	0	0	0	0	0
91	1289742	G	45132.39604	1278	23	2	Male	25-07-23	0	0	0	0	0
92	1294499	KS	45378.75616	546 2024	21	2	Female	27-03-24	1	1	1	3	1
93	1298788	Kk	45033.49977	708	16	1	Male	17-04-23	0	0	0	0	0
94	1299694	M	45439.77277	896	11	1	Male	27-05-24	1	1	1	3	1
95	1314511	RK	45427.50164	857	29	2	Female	15-05-24	1	1	0	2	1
96	1325998	Ak	45125.39453	1257	20	1	Male	18-07-23	1	0	0	1	0
97	1334271	J	45031.49027	706	30	2	Male	15-04-23	0	0	0	0	0
98	1347694	Ss	45461.73263	1262	25	2	Female	18-06-24	1	0	0	1	0
99	1360228	PK	45051.63552	816-2023	13	1	Female	05-05-23	1	0	0	1	0
100	1374372	JS	45447.59016	974	45	3	Male	04-06-24	1	0	0	1	0
101	1378621	Ks	45096.41938	1086	31	2	Male	19-06-23	0	0	0	0	0
102	1380808	Gk	45439.4977	923	37	2	Female	27-05-24	0	1	1	2	1
103	1382472	B	45058.64323	865	28	2	Male	12-05-23	0	0	0	0	0
104	1386261	Kk	45443.50072	-	50	3	Female	31-05-24	0	0	0	0	0
105	1397031	Js	45106.40911	1140	33	2	Male	29-06-23	0	0	0	0	0
106	1402514	MA	45111.64476	1176	39	2	Female	04-07-23	0	0	0	0	0
107	1411355	Ss	45055.44303	827	18	1	Male	09-05-23	0	0	0	0	0
108	1416833	R	44999.41605	456	20	1	Female	04-02-02	0	0	0	0	0
109	1421345	SK	45055.44632	838	18	1	Male	09-05-23	0	0	0	0	0
110	1421774	MS	45446.60918	968	19	1	Male	03-06-24	0	0	0	0	0
111	1423158	DP	45115.46258	1193	53	3	Male	08-07-23	1	1	1	3	1
112	1431687	Pb	45456.42883	1027	48	3	Female	13-06-24	1	0	1	2	1

S No.	MRD No.	Initials	Is there any family history of migrainous headache ?	If answer to previous question is 'Yes', kindly specify in whom ?	Was there any headache in last 3 days ?	Duration of headache ?	Have you ever experienced similar kind of headache before ?	What was the severity of headache ?	Was the onset of headache after EEG test ?	Did you require any medicine for relief from headache ?
57	896952	SS	No	-	No	-	No	-	No	No
58	903169	S	No	-	-	-	-	-	-	-
59	930578	GS	No	-	-	-	-	-	-	-
60	945863	JK	No	-	No	-	No	-	No	No
61	962325	L	No	-	No	-	No	-	No	No
62	982296	Op	No	-	No	-	No	-	No	No
63	988641	MG	No	-	No	-	No	-	No	No
64	991751	DS	No	-	No	-	No	-	No	No
65	1012130	Rk	No	-	-	-	-	-	-	-
66	1018715	Sk	No	-	-	-	-	-	-	-
67	1029805	K	No	-	No	-	No	No	No	No
68	1083158	LSB	Yes	Others	No	-	No	-	No	No
69	1085935	N	No	-	No	-	Yes	0	No	No
70	1089345	HG	No	-	Yes	Minutes	No	4	No	No
71	1097879	As	No	-	No	-	No	-	No	No
72	1124547	A	No	-	No	-	No	-	No	No
73	1130242	AK	No	-	No	-	No	-	No	No
74	1133069	Gs	No	-	-	-	-	-	-	-
75	1185205	GS	No	-	No	-	No	-	No	No
76	1199335	Kk	No	-	No	-	No	-	No	No
77	1201172	JS	No	-	No	-	No	-	No	No
78	1206577	M	Yes	Others	No	-	No	-	No	No
79	1210890	Mw	No	-	No	-	No	-	No	No
80	1227439	GSS	No	-	No	-	No	-	No	No
81	1242262	PA	No	-	No	-	No	-	No	No
82	1247604	Ng	No	-	No	-	No	-	No	No
83	1249808	J	No	-	-	-	-	-	-	-
84	1258060	JSC	No	-	No	-	No	-	No	No
85	1258305	Kk	Yes	Mother	No	-	No	-	No	No
86	1260656	RR	No	-	No	-	No	-	No	No
87	1265491	HK	No	-	-	-	-	-	-	-
88	1269407	SG	No	-	-	-	-	-	-	-
89	1277645	SJ	No	-	No	-	No	-	No	No
90	1282346	R	No	-	No	-	No	-	No	No
91	1289742	G	No	-	No	-	No	-	No	No
92	1294499	KS	No	-	No	-	No	-	No	No
93	1298788	Kk	No	-	-	-	-	-	-	-
94	1299694	M	No	-	No	-	No	-	No	Yes
95	1314511	RK	Yes	Father	No	-	No	-	No	No
96	1325998	Ak	No	-	-	-	-	-	-	-
97	1334271	J	No	-	No	-	No	-	No	No
98	1347694	Ss	No	-	No	-	No	-	No	No
99	1360228	PK	Yes	Mother	No	-	Yes	0	No	No
100	1374372	JS	No	-	No	-	No	-	No	No
101	1378621	Ks	No	Others	-	-	-	-	-	-
102	1380808	Gk	No	-	No	-	No	-	No	No
103	1382472	B	No	-	-	-	-	-	-	-
104	1386261	Kk	No	-	No	-	No	-	No	No
105	1397031	Js	No	-	-	-	-	-	-	-
106	1402514	MA	No	-	No	-	No	-	No	No
107	1411355	Ss	No	-	No	-	No	-	No	No
108	1416833	R	No	-	-	-	-	-	-	-
109	1421345	SK	No	-	-	-	-	-	-	-
110	1421774	MS	No	-	-	-	-	-	-	-
111	1423158	DP	Yes	Son	No	-	No	-	No	No
112	1431687	Pb	No	-	No	-	No	-	No	No

S No.	MRD No.	Initials	Timestamp	EEG ID	Age	AGE GROUP	Sex	Date	Has the headache limited your activities for a day or more in the last three months?	Are you nauseated / sick to your stomach when you have a headache?	Does light bother you when you have a headache?	SCORE	Migrane
113	1434268	Rs	45007.58197	527	26	2	Female	22-03-23	0	0	0	0	0
114	1445953	Ss	45022.39935	629	31	2	Male	04-06-23	1	1	1	3	1
115	1446745	Rp	45204.78355	17882023	28	2	Female	02-10-23	0	0	0	0	0
116	1447478	GS	45033.53731	708	31	2	Male	17-04-23	1	1	0	2	1
117	1452562	Bk	45054.38227	825	43	3	Male	08-05-23	0	0	0	0	0
118	1454277	Pk	45043.54598	758 2023	38	2	Female	27-04-23	1	1	1	3	1
119	1463576	Vc	45155.49637	1446	22	2	Male	17-08-23	0	0	0	0	0
120	1468218	A	45000.60657	540	19	1	Male	16-09-03	0	0	0	0	0
121	1469204	MS	45009.65031	545-2023	19	1	Male	24-03-23	1	0	0	1	0
122	1470744	SB	44984.76881	512	34	2	Female	27-02-23	1	0	0	1	0
123	1472067	Bk	44986.80329	223	49	3	Female	01-03-23	1	0	1	2	1
124	1474127	MK	45426.43368	843	64	4	Male	14-05-24	0	0	0	0	0
125	1479441	TS	44998.4934	533	35	2	Male	13-03-23	1	0	0	1	0
126	1480171	HSC	45009.60579	536	16	1	Male	23-03-23	1	1	0	2	1
127	1480204	Gs	44999.39563	345	11	1	Male	14-03-23	0	0	0	0	0
128	1480270	A	44999.46495	434	19	1	Male	18-05-04	1	1	1	3	1
129	1480629	SK	45065.50328	896 2023	29	2	Female	19-05-23	1	1	1	3	1
130	1481891	Gd	45001.67155	1481891	54	3	Female	16-03-23	0	1	0	1	0
131	1481901	AK	45001.68112	486-2023	16	1	Female	16-03-23	0	1	0	1	0
132	1481923	Ss	45001.66598	482-2023	28	2	Male	16-03-23	0	0	0	0	0
133	1482756	Hs	45002.55675	1482756	15	1	Male	17-03-23	1	0	1	2	1
134	1482786	Hs	45002.55354	1482786	15	1	Male	17-03-23	1	0	1	2	1
135	1482814	Js	45002.55905	494	54	3	Male	17-04-23	0	0	0	0	0
136	1482995	NK	45441.54201	877	62	4	Female	29-05-24	0	1	0	1	0
137	1483070	MS	45003.49178	501-2023	38	2	Male	18-03-23	1	1	0	2	1
138	1483136	GS	45052.39281	820	58	3	Male	06-05-23	1	0	0	1	0
139	1483161	PS	45003.44076	496-2023	33	2	Male	18-03-23	0	0	0	0	0
140	1483192	Sm	45003.46157	497-2023	21	2	Female	18-03-23	0	1	0	1	0
141	1485341	N	45007.38039	520	16	1	Female	22-03-23	1	1	1	3	1
142	1485513	AK	45007.49288	524	25	2	Female	17-02-98	1	1	0	2	1
143	1485887	MK	45007.66689	542-2023	13	1	Female	22-03-23	1	0	0	1	0
144	1486293	Tk	45015.42951	571-2023	12	1	Female	30-03-23	0	0	0	0	0
145	1487514	VN	45010.61615	549	69	4	Male	25-03-23	0	0	0	0	0
146	1487638	SR	45010.63167	550	58	3	Female	26-03-23	0	0	1	1	0
147	1487959	HG	45012.53971	552-2023	15	1	Male	27-03-23	0	0	0	0	0
148	1488073	Aj	45013.43112	558	66	4	Female	28-03-23	0	0	0	0	0
149	1488261	MS	45012.48794	551-2023	48	3	Male	27-03-23	0	0	0	0	0
150	1488358	Jp	45012.54483	553	35	2	Male	27-03-23	0	0	0	0	0
151	1488516	M	45012.63609	557-2023	30	2	Male	27-03-23	1	0	0	1	0
152	1488721	Bs	45379.47998	552	43	3	Male	28-03-24	0	0	0	0	0
153	1488778	Ds	45383.63368	552	43	3	Male	01-04-24	0	1	1	2	1
154	1488791	BA	45382.39303	552	43	3	Male	31-03-24	0	0	1	1	0
155	1489723	Av	45014.49194	570	17	1	Female	29-03-23	0	0	0	0	0
156	1490051	K	45015.57189	574	16	1	Male	30-03-23	1	0	0	1	0
157	1490287	R	45045.56769	773	40	2	Female	29-04-23	1	1	1	3	1
158	1491107	L	45020.4448	60004	51	3	Female	04-04-23	0	0	0	0	0
159	1492049	Mk	45022.54834	634	17	1	Female	26-12-06	0	0	0	0	0
160	1492160	Pk	45019.59831	59	40	2	Female	03-04-23	0	0	0	0	0
161	1492294	J	45052.55711	822	26	2	Female	06-05-23	1	0	0	1	0
162	1492652	HK	45020.43302	599	14	1	Female	04-04-23	0	0	0	0	0
163	1492697	Kk	45020.45247	604	50	3	Female	04-04-23	1	1	1	3	1
164	1492756	K	45020.59613	604	22	2	Female	04-04-23	1	0	0	1	0
165	1492763	GK	45020.51676	601	20	1	Female	04-04-23	0	0	0	0	0
166	1492788	JS	45020.62831	612	11	1	Male	04-04-23	0	0	0	0	0
167	1492818	R	45020.65336	611	23	2	Female	04-04-23	1	0	0	1	0
168	1492864	AK	45020.67691	608	47	3	Female	04-04-23	0	0	0	0	0

S No.	MRD No.	Initials	Is there any family history of migrainous headache ?	If answer to previous question is 'Yes', kindly specify in whom ?	Was there any headache in last 3 days ?	Duration of headache ?	Have you ever experienced similar kind of headache before ?	What was the severity of headache ?	Was the onset of headache after EEG test ?	Did you require any medicine for relief from headache ?
113	1434268	Rs	No	-	No	-	No	-	No	No
114	1445953	Ss	Yes	Father	Yes	Minutes	Yes	6	No	No
115	1446745	Rp	No	-	No	-	No	-	No	No
116	1447478	GS	No	-	No	-	No	-	No	No
117	1452562	Bk	No	-	No	-	No	-	No	No
118	1454277	Pk	No	-	-	-	-	-	-	-
119	1463576	Vc	Yes	Father	No	-	No	-	No	No
120	1468218	A	No	-	No	-	No	-	No	No
121	1469204	MS	No	-	No	-	Yes	0	No	No
122	1470744	SB	No	-	No	-	No	-	No	No
123	1472067	Bk	No	-	-	-	-	-	-	-
124	1474127	MK	No	-	No	-	No	-	No	No
125	1479441	TS	No	-	No	-	Yes	0	No	No
126	1480171	HSC	No	-	Yes	Minutes	Yes	4	No	Yes
127	1480204	Gs	No	-	-	-	-	-	-	-
128	1480270	A	No	-	-	-	-	-	-	-
129	1480629	SK	No	-	-	-	-	-	-	-
130	1481891	Gd	No	-	No	-	No	-	No	No
131	1481901	AK	Yes	Father	-	-	-	-	-	-
132	1481923	Ss	Yes	Others	No	-	No	-	No	No
133	1482756	Hs	Yes	Mother	-	-	-	-	-	-
134	1482786	Hs	Yes	Mother	No	-	No	-	No	Yes
135	1482814	Js	Yes	Others	-	-	-	-	-	-
136	1482995	NK	No	-	No	-	No	-	No	No
137	1483070	MS	Yes	Mother	-	-	-	-	-	-
138	1483136	GS	No	-	-	-	-	-	-	-
139	1483161	PS	No	-	No	-	No	-	No	No
140	1483192	Sm	No	-	No	-	No	-	No	No
141	1485341	N	Yes	Mother	Yes	Days	Yes	2	no	Yes
142	1485513	AK	Yes	Others	No	-	No	-	No	No
143	1485887	MK	No	-	No	-	Yes	0	No	No
144	1486293	Tk	No	-	-	-	-	-	-	-
145	1487514	VN	No	-	No	-	No	-	No	No
146	1487638	SR	No	-	Yes	Hours	Yes	2	No	No
147	1487959	HG	No	-	No	-	No	-	No	No
148	1488073	Aj	No	-	No	-	No	-	No	No
149	1488261	MS	No	-	No	-	No	-	No	No
150	1488358	Jp	No	-	-	-	-	-	-	-
151	1488516	M	No	-	-	-	-	-	-	-
152	1488721	Bs	No	-	No	-	Yes	0	No	No
153	1488778	Ds	Yes	Others	-	-	-	-	-	-
154	1488791	BA	No	-	No	-	No	-	Yes	Yes
155	1489723	Av	Yes	Mother	Yes	Hours	No	4	No	No
156	1490051	K	No	-	No	-	-	-	No	No
157	1490287	R	Yes	Brother	No	-	-	-	No	Yes
158	1491107	L	No	-	No	-	No	-	No	No
159	1492049	Mk	No	-	No	-	No	2	Yes	No
160	1492160	Pk	No	-	No	-	No	-	No	No
161	1492294	J	No	-	-	-	-	-	-	-
162	1492652	HK	No	-	-	-	-	-	-	-
163	1492697	Kk	No	-	No	-	No	-	No	No
164	1492756	K	Yes	Brother	Yes	Minutes	Yes	2	No	Yes
165	1492763	GK	No	-	No	-	No	-	No	No
166	1492788	JS	Yes	Father	No	-	No	-	No	No
167	1492818	R	No	-	No	-	No	-	No	No
168	1492864	AK	No	-	No	-	No	-	No	No

S No.	MRD No.	Initials	Timestamp	EEG ID	Age	AGE GROUP	Sex	Date	Has the headache limited your activities for a day or more in the last three months?	Are you nauseated / sick to your stomach when you have a headache?	Does light bother you when you have a headache?	SCORE	Migrane
169	1492951	Ss	45022.39802	629	31	2	Male	04-06-23	0	0	0	0	0
170	1493367	Gs	45021.61156	623	45	3	Male	05-04-23	1	0	0	1	0
171	1494404	KS	45022.63536	641	45	3	Female	06-04-23	1	1	0	2	1
172	1494545	Pk	45023.37181	9993	22	2	Female	07-04-23	1	0	0	1	0
173	1494837	PS	45023.43309	636	20	1	Male	07-04-23	0	0	0	0	0
174	1495380	M	45024.52899	650	42	3	Female	08-04-23	0	0	1	1	0
175	1495554	BSB	45086.52554	1017	19	1	Male	12-07-04	0	0	0	0	0
176	1495672	AS	45024.52703	658	33	2	Male	07-07-89	0	0	1	1	0
177	1496324	Mk	45026.45586	659	14	1	Female	10-04-23	0	0	0	0	0
178	1496354	E	45026.6112	665	12	1	Female	10-04-23	0	0	0	0	0
179	1497070	Ss	45027.39546	670	20	1	Male	11-04-23	1	0	1	2	1
180	1497124	Ik	45027.46008	671	17	1	Female	10-02-06	1	1	0	2	1
181	1497912	UB	45028.49275	674	14	1	Female	12-04-23	1	0	1	2	1
182	1498037	Ac	45028.59509	680	34	2	Female	12-04-23	1	1	1	3	1
183	1498627	Bk	45029.48924	684	57	3	Female	09-04-23	0	0	1	1	0
184	1499386	Td	45031.43113	698	43	3	Female	04-04-23	0	0	0	0	0
185	1500058	SY	45033.45459	704	28	2	Female	17-04-23	0	0	0	0	0
186	1500062	Pd	45033.57139	710	60	3	Female	17-04-23	0	0	0	0	0
187	1501005	RPM	45034.48345	711	68	4	Male	18-04-23	0	0	0	0	0
188	1501054	Ks	45415.55953	774	18	1	Male	03-05-24	0	0	0	0	0
189	1502372	Pk	45351.6737	373	27	2	Male	29-02-24	1	1	1	3	1
190	1503589	P	45045.5741	773	40	2	Female	29-04-23	1	0	0	1	0
191	1505021	Mk	45041.52689	745	36	2	Female	25-04-23	1	1	1	3	1
192	1507146	SS	45044.62832	765	22	2	Male	28-04-23	0	0	0	0	0
193	1507207	Hk	45044.41123	762	15	1	Female	28-04-23	1	0	1	2	1
194	1507944	AS	45439.565	930	26	2	Female	27-05-24	0	0	0	0	0
195	1508523	HS	45047.78784	783	22	2	Male	01-05-23	0	0	0	0	0
196	1508559	Z	45047.67382	781	45	3	Female	01-05-23	1	0	1	2	1
197	1508571	Ks	45047.45801	747	11	1	Male	01-05-23	0	0	0	0	0
198	1509311	Mk	45048.59611	787	29	2	Male	02-05-23	1	1	0	2	1
199	1509324	pR	45048.67826	778	26	2	Female	09-05-96	0	0	0	0	0
200	1509340	As	45048.57566	7862023	24	2	Male	02-05-23	1	0	1	2	1
201	1509361	Kk	45048.4601	785	36	2	Female	02-05-23	1	1	1	3	1
202	1509778	PK	45057.5148	860	24	2	Male	04-05-23	1	0	1	2	1
203	1509922	fd	45049.5665	793	22	2	Female	03-05-23	1	1	1	3	1
204	1509973	Bs	45049.39652	789	30	2	Female	03-05-23	0	1	0	1	0
205	1510148	S	45052.49086	821	22	2	Female	06-05-23	0	0	0	0	0
206	1510218	Sr	45049.59337	795	22	2	Female	09-05-23	1	0	1	2	1
207	1510551	SS	45051.62983	815	15	1	Male	05-05-23	0	0	1	1	0
208	1510630	Ad	45050.6083	802	25	2	Male	04-05-23	0	1	1	2	1
209	1510664	SG	45050.52602	798	27	2	Male	07-05-23	1	1	1	3	1
210	1510688	J	45050.62039	805	45	3	Female	04-05-23	1	0	0	1	0
211	1510725	T	45050.45644	799	16	1	Male	04-05-23	0	0	0	0	0
212	1510919	TK	45051.412	810	41	3	Male	05-05-23	0	0	0	0	0
213	1510981	Nk	45050.66605	807	42	3	Male	04-05-23	1	0	1	2	1
214	1511321	M	45051.56786	813	55	3	Male	05-05-23	0	0	0	0	0
215	1512396	N	45124.55278	1254	28	2	Female	15-07-23	0	0	0	0	0
216	1513136	JK	45056.44221	830	13	1	Female	06-05-23	0	0	0	0	0
217	1513638	Sk	45055.44287	839	15	1	Female	07-05-23	0	0	0	0	0
218	1514355	N	45056.5673	851	17	1	Female	10-05-23	0	0	0	0	0
219	1514584	Js	45066.4789	900	15	1	Male	20-05-23	0	0	0	0	0
220	1515196	Ps	45057.50986	858	23	2	Male	04-05-23	1	1	1	3	1
221	1516032	JK	45058.56008	864	27	2	Female	13-08-96	0	0	0	0	0
222	1516214	js	45059.54714	866	24	2	Male	18-05-23	0	0	0	0	0
223	1516346	RK	45061.40509	872	54	3	Female	15-05-23	0	0	0	0	0
224	1516398	SN	45059.55164	868	17	1	Male	13-05-23	0	0	0	0	0

S No.	MRD No.	Initials	Is there any family history of migrainous headache ?	If answer to previous question is 'Yes', kindly specify in whom ?	Was there any headache in last 3 days ?	Duration of headache ?	Have you ever experienced similar kind of headache before ?	What was the severity of headache ?	Was the onset of headache after EEG test ?	Did you require any medicine for relief from headache ?
169	1492951	Ss	Yes	Sister	No	-	No	-	No	No
170	1493367	Gs	No	-	No	-	Yes	0	No	No
171	1494404	KS	Yes	Mother	No	-	No	-	No	No
172	1494545	Pk	No	-	Yes	Minutes	Yes	2	No	No
173	1494837	PS	No	-	-	-	-	-	-	-
174	1495380	M	No	-	No	-	No	-	No	No
175	1495554	BSB	No	-	No	-	No	-	No	No
176	1495672	AS	No	-	-	-	-	-	-	-
177	1496324	Mk	No	-	No	-	No	-	No	No
178	1496354	E	Yes	Mother	-	-	-	-	-	-
179	1497070	Ss	No	-	No	-	No	-	No	No
180	1497124	Ik	Yes	Mother	Yes	Minutes	Yes	8	Yes	Yes
181	1497912	UB	No	-	No	-	No	-	No	No
182	1498037	Ac	No	-	No	-	No	-	No	No
183	1498627	Bk	No	-	No	-	No	-	No	No
184	1499386	Td	No	-	No	-	No	-	No	No
185	1500058	SY	No	-	-	-	-	-	-	-
186	1500062	Pd	No	-	-	-	-	-	-	-
187	1501005	RPM	No	-	-	-	-	-	-	-
188	1501054	Ks	No	-	No	-	No	-	No	No
189	1502372	Pk	No	-	No	-	No	4	Yes	Yes
190	1503589	P	No	-	No	-	No	-	No	No
191	1505021	Mk	No	-	-	-	-	-	-	-
192	1507146	SS	No	-	No	-	No	-	No	No
193	1507207	Hk	No	-	No	-	No	-	No	No
194	1507944	AS	No	-	No	Minutes	Yes	6	No	Yes
195	1508523	HS	No	-	No	-	No	-	No	No
196	1508559	Z	No	-	No	-	No	-	No	No
197	1508571	Ks	No	-	No	-	No	-	No	No
198	1509311	Mk	No	-	-	-	-	-	-	-
199	1509324	pR	Yes	Mother	No	-	No	-	No	No
200	1509340	As	No	-	No	-	No	-	No	No
201	1509361	Kk	Yes	Sister	Yes	Minutes	No	2	No	Yes
202	1509778	PK	Yes	Brother	No	-	No	-	No	No
203	1509922	fd	No	-	No	-	No	-	No	No
204	1509973	Bs	No	-	-	-	-	-	-	-
205	1510148	S	No	-	No	-	No	-	No	No
206	1510218	Sr	No	-	No	-	No	-	No	No
207	1510551	SS	No	-	No	-	No	-	No	No
208	1510630	Ad	No	-	Yes	Hours	Yes	10	No	No
209	1510664	SG	No	-	No	-	No	-	No	No
210	1510688	J	Yes	Mother	No	-	No	-	No	No
211	1510725	T	No	-	-	-	-	-	-	-
212	1510919	TK	No	-	Yes	Minutes	No	-	No	No
213	1510981	Nk	No	-	-	-	-	-	-	-
214	1511321	M	No	-	No	-	No	2	No	No
215	1512396	N	Yes	Others	No	-	No	-	No	No
216	1513136	JK	No	-	No	-	No	-	No	No
217	1513638	Sk	Yes	Daughter	No	-	No	-	No	No
218	1514355	N	No	-	No	-	No	-	No	No
219	1514584	Js	No	-	-	-	-	-	-	-
220	1515196	Ps	Yes	Brother	No	-	No	-	No	No
221	1516032	JK	No	-	-	-	-	-	-	-
222	1516214	js	No	-	No	-	No	-	No	No
223	1516346	RK	No	-	No	-	No	-	No	No
224	1516398	SN	No	-	No	-	No	-	No	No

S No.	MRD No.	Initials	Timestamp	EEG ID	Age	AGE GROUP	Sex	Date	Has the headache limited your activities for a day or more in the last three months?	Are you nauseated / sick to your stomach when you have a headache?	Does light bother you when you have a headache?	SCORE	Migrane
225	1517216	VS	45061.61631	875	42	3	Male	15-05-23	0	0	1	1	0
226	1517290	Ss	45061.41399	871	21	2	Male	15-05-23	0	0	0	0	0
227	1517374	P	45093.55012	1073	17	1	Male	16-06-23	1	0	0	1	0
228	1517394	Kg	45061.62366	876	17	1	Male	15-05-23	1	1	0	2	1
229	1517480	Sk	45061.48315	873	41	3	Female	15-05-23	1	1	0	2	1
230	1519557	Mk	45064.6144	893	36	2	Male	18-05-23	1	0	0	1	0
231	1520104	As	45065.4326	895	13	1	Male	19-05-23	1	0	0	1	0
232	1520790	Hs	45068.60528	923	29	2	Male	22-05-23	1	0	1	2	1
233	1520792	Hk	45068.6033	910	29	2	Male	22-05-23	1	0	1	2	1
234	1521051	A	45097.70255	1001	28	2	Male	20-06-23	1	0	0	1	0
235	1521461	AS	45068.79042	9082023	20	1	Male	22-05-23	0	0	0	0	0
236	1522075	p	45069.44013	917	23	2	Female	15-05-23	1	0	1	2	1
237	1522195	Gk	45069.48843	918	13	1	Female	12-05-23	0	0	0	0	0
238	1522508	A	45070.41598	920	30	2	Male	24-05-23	0	0	0	0	0
239	1523182	P	45071.50583	937	14	1	Female	25-05-23	0	1	1	2	1
240	1523323	VVS	45071.73988	940	16	1	Male	25-05-23	0	0	1	1	0
241	1523324	BVS	45096.60647	1091	16	1	Male	31-10-07	1	1	0	2	1
242	1523869	PR	45072.49362	945	28	2	Female	26-05-23	1	0	1	2	1
243	1523985	Sk	45072.49972	943	50	3	Female	26-05-23	1	0	0	1	0
244	1524279	PK	45072.596	947	16	1	Female	26-05-23	1	0	1	2	1
245	1525021	AS	45073.72664	950	16	1	Male	27-05-23	0	0	1	1	0
246	1526327	AK	45076.4488	962	25	2	Male	30-05-23	1	1	1	3	1
247	1527591	HS	45078.45459	969	25	2	Male	21-02-98	0	0	1	1	0
248	1528055	as	45079.63465	977	14	1	Male	02-06-23	0	0	0	0	0
249	1528434	MR	45079.54399	976	43	3	Male	02-06-23	0	0	1	1	0
250	1528905	SKJ	45080.46759	979	82	4	Female	01-06-23	1	0	0	1	0
251	1529575	BK	45082.47861	985	21	2	Female	05-06-23	1	0	1	2	1
252	1529768	Nd	45085.72727	9993	35	2	Female	08-06-23	1	0	1	2	1
253	1530838	Ps	45083.638	995	25	2	Male	06-06-23	0	0	0	0	0
254	1531080	AK	45084.4866	1000	16	1	Female	07-06-23	1	0	0	1	0
255	1531105	Ak	45087.4003	1019	20	1	Female	10-06-23	0	0	0	0	0
256	1531107	Hk	45084.6026	1003	42	3	Female	07-06-23	0	0	1	1	0
257	1531166	AS	45084.53955	1002	27	2	Male	05-06-23	1	0	0	1	0
258	1531499	AJ	45085.43933	1008	44	3	Female	08-06-23	0	0	0	0	0
259	1533960	Sk	45089.55134	1039	27	2	Male	12-06-23	1	0	1	2	1
260	1534032	AS	45089.69807	1041	23	2	Female	12-06-23	0	0	0	0	0
261	1534226	P	45090.74189	1050	40	2	Female	13-06-23	0	0	0	0	0
262	1534791	Ss	45090.48047	1047	21	2	Male	13-06-23	0	1	1	2	1
263	1535481	Ap	45091.624	10602023	36	2	Male	14-06-23	1	0	0	1	0
264	1535653	Kk	45091.47883	1057	17	1	Female	14-06-23	1	0	0	1	0
265	1536070	V	45092.38902	1066	23	2	Female	15-06-23	1	0	0	1	0
266	1536078	Jb	45092.52701	1067	50	3	Female	12-07-73	1	0	0	1	0
267	1536746	AS	45093.47869	1071	15	1	Male	16-06-23	1	0	0	1	0
268	1537046	As	45093.54522	1074	15	1	Male	16-06-23	1	0	1	2	1
269	1537052	Gk	45093.72706	1076	24	2	Female	16-06-23	0	0	0	0	0
270	1537697	NS	45094.83372	1083-2023	32	2	Male	17-06-23	0	0	0	0	0
271	1537953	MK	45097.64649	1088	36	2	Female	20-06-23	0	0	0	0	0
272	1538405	NS	45094.76647	1083	32	2	Male	17-06-23	0	0	0	0	0
273	1538432	PC	45097.36213	1907	19	1	Female	20-06-23	0	0	0	0	0
274	1538828	IkM	45097.36108	1099	17	1	Female	20-06-23	0	0	0	0	0
275	1539041	T	45097.62172	1099	14	1	Female	20-06-23	0	0	0	0	0
276	1539795	M	45098.57346	1007	17	1	Female	23-06-23	0	0	0	0	0
277	1539897	SG	45099.35859	1011	21	2	Male	17-06-23	0	1	0	1	0
278	1540639	Gs	45100.37733	1105	30	2	Male	23-06-23	1	0	1	2	1
279	1540660	M	45100.45475	1107	49	3	Female	23-06-23	0	0	0	0	0
280	1540906	Lb	45100.60455	1110	18	1	Male	23-06-23	1	0	0	1	0

S No.	MRD No.	Initials	Is there any family history of migrainous headache ?	If answer to previous question is 'Yes', kindly specify in whom ?	Was there any headache in last 3 days ?	Duration of headache ?	Have you ever experienced similar kind of headache before ?	What was the severity of headache ?	Was the onset of headache after EEG test ?	Did you require any medicine for relief from headache ?
225	1517216	VS	No	-	No	-	No	-	No	No
226	1517290	Ss	Yes	Others	Yes	Minutes	No	8	Yes	No
227	1517374	P	No	-	No	-	No	-	No	No
228	1517394	Kg	Yes	Mother	No	-	No	-	No	No
229	1517480	Sk	No	-	-	-	-	-	-	-
230	1519557	Mk	No	-	No	-	No	-	No	No
231	1520104	As	Yes	Mother	No	-	No	-	No	No
232	1520790	Hs	No	-	No	-	No	-	No	No
233	1520792	Hk	No	-	-	-	-	-	-	-
234	1521051	A	No	-	-	-	-	-	-	-
235	1521461	AS	No	-	No	-	No	-	No	No
236	1522075	p	No	-	No	-	Yes	0	No	No
237	1522195	Gk	No	-	No	-	No	-	No	No
238	1522508	A	No	-	No	-	No	-	No	No
239	1523182	P	Yes	Mother	No	-	No	-	No	No
240	1523323	VVS	No	-	-	-	-	-	-	-
241	1523324	BVS	No	-	No	-	No	-	No	No
242	1523869	PR	No	-	No	-	No	-	No	No
243	1523985	Sk	Yes	Son	No	-	No	-	No	No
244	1524279	PK	No	-	-	-	-	-	-	-
245	1525021	AS	No	-	No	-	No	4	No	No
246	1526327	AK	No	-	No	-	No	-	No	No
247	1527591	HS	No	-	-	-	-	-	-	-
248	1528055	as	No	-	No	-	No	-	No	No
249	1528434	MR	No	-	No	-	No	-	No	No
250	1528905	SKJ	No	-	No	-	No	-	No	No
251	1529575	BK	No	-	-	-	-	-	-	-
252	1529768	Nd	Yes	Son	No	-	No	-	No	No
253	1530838	Ps	No	-	-	-	-	-	-	-
254	1531080	AK	No	-	No	-	No	-	No	No
255	1531105	Ak	No	-	No	-	No	-	No	No
256	1531107	Hk	No	-	Yes	Minutes	Yes	2	No	Yes
257	1531166	AS	No	-	No	-	No	-	No	No
258	1531499	AJ	No	-	No	-	No	-	No	No
259	1533960	Sk	No	-	No	-	No	-	No	No
260	1534032	AS	No	-	No	-	No	-	No	No
261	1534226	P	No	-	No	-	No	-	No	No
262	1534791	Ss	Yes	Mother	No	-	No	-	No	No
263	1535481	Ap	No	-	No	-	No	-	No	No
264	1535653	Kk	No	-	No	-	No	-	No	No
265	1536070	V	No	-	Yes	Hours	Yes	4	No	Yes
266	1536078	Jb	Yes	Mother	-	-	-	-	-	-
267	1536746	AS	No	-	-	-	-	-	-	-
268	1537046	As	Yes	Father	No	-	No	-	No	No
269	1537052	Gk	No	-	No	-	No	-	No	No
270	1537697	NS	No	Others	No	-	No	-	No	No
271	1537953	MK	No	-	No	-	No	-	No	No
272	1538405	NS	No	Others	No	-	No	-	No	No
273	1538432	PC	No	-	-	-	-	-	-	-
274	1538828	IkM	No	-	-	-	-	-	-	-
275	1539041	T	No	-	-	-	-	-	-	-
276	1539795	M	No	-	No	-	No	-	No	No
277	1539897	SG	No	-	No	-	No	-	No	No
278	1540639	Gs	Yes	Sister	Yes	Hours	Yes	10	Yes	Yes
279	1540660	M	No	-	No	-	No	-	No	No
280	1540906	Lb	No	-	-	-	-	-	-	-

S No.	MRD No.	Initials	Timestamp	EEG ID	Age	AGE GROUP	Sex	Date	Has the headache limited your activities for a day or more in the last three months?	Are you nauseated / sick to your stomach when you have a headache?	Does light bother you when you have a headache?	SCORE	Migrane
281	1541421	MS	45101.50049	1114	45	3	Female	24-06-23	0	0	0	0	0
282	1541709	GS	45443.44894	-	38	2	Male	31-05-24	1	0	0	1	0
283	1541815	Uk	45103.62464	1126	31	2	Male	26-06-23	1	0	1	2	1
284	1542460	Ns	45104.51628	1131	50	3	Male	27-06-23	1	0	0	1	0
285	1543324	S	45108.74201	1159	28	2	Female	01-07-23	0	0	0	0	0
286	1544578	G	45033.53872	709	31	2	Male	17-04-23	1	1	0	2	1
287	1544814	Mc	45424.537	801	10	1	Male	11-05-24	1	1	1	3	1
288	1545085	BA	45108.52575	1153	34	2	Female	01-07-23	0	0	1	1	0
289	1545127	Rk	45136.73741	1298	26	2	Female	26-07-23	1	0	0	1	0
290	1545664	GSS	45110.52478	1165	17	1	Male	03-07-23	0	0	0	0	0
291	1546728	Am	45111.55179	1170	11	1	Male	04-07-23	0	0	0	0	0
292	1547115	Ks	45259.6244	2127	30	2	Male	29/11/0023	1	0	1	2	1
293	1547120	Bk	45112.43527	1177	50	3	Female	05-07-23	1	0	0	1	0
294	1547213	AT	45112.76179	1180	20	1	Male	05-07-23	1	0	1	2	1
295	1547514	Mk	45113.48742	1184	17	1	Female	06-07-23	1	1	1	3	1
296	1549072	Gs	45115.57402	1205	26	2	Male	08-07-23	0	0	0	0	0
297	1549106	JS	45115.57311	1195	41	3	Male	09-07-23	1	0	1	2	1
298	1550090	Rs	45118.54444	1212	32	2	Male	10-07-23	1	0	0	1	0
299	1550600	Ln	45432.64036	890	17	1	Male	20-05-24	1	0	1	2	1
300	1551291	KK	45119.59873	1226	55	3	Female	12-07-23	0	0	0	0	0
301	1552289	Rk	45121.59773	1245	37	2	Male	14-07-23	1	1	1	3	1
302	1553478	MS	45126.58091	1265	28	2	Male	19-07-23	1	1	1	3	1
303	1554386	TK	45125.39361	1256	56	3	Female	18-07-23	0	0	0	0	0
304	1554412	Ak	45125.59852	1259	18	1	Male	18-07-23	0	0	0	0	0
305	1555908	Ks	45128.43189	1271	32	2	Male	21-07-23	1	0	0	1	0
306	1556285	hk	45128.4948	1276	60	3	Female	21-07-23	0	0	0	0	0
307	1557503	Hs	45446.61932	969	45	3	Male	03-06-24	0	0	0	0	0
308	1557772	Mk	45131.45388	1277	15	1	Female	24-07-23	0	0	1	1	0
309	1563029	Gs	45471.50378	1129	16	1	Male	28-06-24	0	0	1	1	0
310	1567197	Pr	45146.51356	1377	15	1	Female	08-08-23	0	0	0	0	0
311	1567996	JS	45147.63199	1394	30	2	Male	09-08-23	0	0	0	0	0
312	1569039	MS	45149.49939	1406	74	4	Male	11-08-23	0	0	0	0	0
313	1569370	Ab	45149.6076	1410	42	3	Female	21-12-82	1	0	0	1	0
314	1569390	N	45149.5606	1411	40	2	Female	11-08-23	0	0	0	0	0
315	1570763	S	45152.57654	1422	18	1	Female	14-08-23	1	0	0	1	0
316	1570884	Ms	45152.50459	1424	31	2	Male	14-08-23	1	0	0	1	0
317	1570926	AS	45154.56756	1440	18	1	Male	16-08-23	1	1	0	2	1
318	1571033	Bk	45152.62075	1426	29	2	Female	14-08-23	0	0	0	0	0
319	1572744	Hs	45164.42959	1522	20	1	Male	26-08-23	1	1	0	2	1
320	1578198	KK	45164.48141	1524	15	1	Female	26-08-23	0	0	1	1	0
321	1578878	STS	45166.55264	1540	15	1	Male	28-08-23	1	1	0	2	1
322	1580309	A	45168.56495	1550	15	1	Female	30-08-23	0	0	0	0	0
323	1581778	Rk	45170.61197	1558	19	1	Female	01-09-23	0	0	0	0	0
324	1590054	PS	45367.4662	484	17	1	Male	16-03-24	0	0	0	0	0
325	1591784	SS	45187.58762	1678	29	2	Male	18-09-23	0	0	0	0	0
326	1596206	Rs	45202.53354	1765	23	2	Male	03-10-23	0	1	1	2	1
327	1596541	J	45195.51876	1721	14	1	Male	26-09-23	0	0	0	0	0
328	1596552	P	45195.44044	1667	17	1	Female	26-09-23	0	0	0	0	0
329	1604569	A	45209.81299	178	19	1	Transgender	10-10-23	0	0	0	0	0
330	1607987	SS	45213.42624	1856	16	1	Male	14-10-23	1	0	1	2	1
331	1615107	HSD	45416.48756	778	14	1	Male	04-05-24	0	0	0	0	0
332	1620056	J	45432.62677	889	23	2	Male	20-05-24	0	0	0	0	0
333	1620088	Nb	45432.60814	885	23	2	Male	20-05-24	0	0	0	0	0
334	1620090	K	45432.63265	893	23	2	Male	20-05-24	0	0	0	0	0
335	1631852	RV	45261.54138	2138	12	1	Female	01-12-23	0	0	0	0	0
336	1635652	VKB	45371.49236	512	71	4	Male	20-03-24	0	0	0	0	0

S No.	MRD No.	Initials	Is there any family history of migrainous headache ?	If answer to previous question is 'Yes', kindly specify in whom ?	Was there any headache in last 3 days ?	Duration of headache ?	Have you ever experienced similar kind of headache before ?	What was the severity of headache ?	Was the onset of headache after EEG test ?	Did you require any medicine for relief from headache ?
281	1541421	MS	No	-	No	-	No	-	No	No
282	1541709	GS	No	-	No	-	No	-	No	No
283	1541815	Uk	No	-	No	-	No	-	No	No
284	1542460	Ns	Yes	Sister	-	-	-	-	-	-
285	1543324	S	No	-	No	-	No	-	No	No
286	1544578	G	No	-	Yes	Minutes	Yes	8	Yes	Yes
287	1544814	Mc	No	-	No	-	No	-	No	No
288	1545085	BA	No	-	No	-	Yes	2	No	No
289	1545127	Rk	No	-	No	-	No	-	No	No
290	1545664	GSS	No	-	No	-	No	-	No	No
291	1546728	Am	No	-	No	-	No	-	No	No
292	1547115	Ks	No	-	No	-	No	-	No	No
293	1547120	Bk	No	-	No	-	No	-	No	No
294	1547213	AT	No	-	No	-	No	-	No	No
295	1547514	Mk	No	-	No	-	No	-	No	No
296	1549072	Gs	Yes	Others	No	-	No	-	No	No
297	1549106	JS	No	-	No	-	No	-	No	No
298	1550090	Rs	Yes	Brother	Yes	Hours	Yes	6	Yes	Yes
299	1550600	Ln	No	-	No	-	No	-	No	No
300	1551291	KK	No	-	No	-	No	-	No	No
301	1552289	Rk	Yes	Mother	No	-	No	-	No	No
302	1553478	MS	No	-	No	-	No	-	No	No
303	1554386	TK	No	-	-	-	-	-	-	-
304	1554412	Ak	No	-	-	-	-	-	-	-
305	1555908	Ks	No	-	No	-	No	-	No	No
306	1556285	hk	No	-	-	-	-	-	-	-
307	1557503	Hs	No	-	No	-	No	-	No	No
308	1557772	Mk	Yes	Mother	No	-	No	-	No	No
309	1563029	Gs	No	-	No	-	No	-	No	No
310	1567197	Pr	No	-	-	-	-	-	-	-
311	1567996	JS	No	-	-	-	-	-	-	-
312	1569039	MS	No	-	-	-	-	-	-	-
313	1569370	Ab	No	-	No	-	No	-	No	Yes
314	1569390	N	No	-	No	-	No	-	No	No
315	1570763	S	Yes	Daughter	No	-	No	0	No	No
316	1570884	Ms	No	-	-	-	-	-	-	-
317	1570926	AS	No	-	No	-	No	-	No	No
318	1571033	Bk	No	-	No	-	No	-	No	No
319	1572744	Hs	No	-	Yes	Minutes	No	-	No	No
320	1578198	KK	No	-	-	-	-	-	-	-
321	1578878	STS	No	-	No	-	No	-	No	No
322	1580309	A	No	-	-	-	-	-	-	-
323	1581778	Rk	Yes	Mother	No	-	No	-	No	Yes
324	1590054	PS	No	-	-	-	-	-	-	-
325	1591784	SS	No	-	-	-	-	-	-	-
326	1596206	Rs	No	-	No	-	No	8	No	No
327	1596541	J	No	-	-	-	-	-	-	-
328	1596552	P	Yes	Father	-	-	-	-	-	-
329	1604569	A	No	-	No	-	No	-	No	No
330	1607987	SS	No	-	No	-	No	-	No	No
331	1615107	HSD	No	-	No	-	No	-	No	No
332	1620056	J	No	-	-	-	-	-	-	-
333	1620088	Nb	No	-	-	-	-	-	-	-
334	1620090	K	No	-	-	-	-	-	-	-
335	1631852	RV	No	-	No	-	No	-	No	No
336	1635652	VKB	No	-	-	-	-	-	-	-

S No.	MRD No.	Initials	Timestamp	EEG ID	Age	AGE GROUP	Sex	Date	Has the headache limited your activities for a day or more in the last three months?	Are you nauseated / sick to your stomach when you have a headache?	Does light bother you when you have a headache?	SCORE	Migrane
337	1641211	A	45411.62822	747	21	2	Female	29-04-24	1	1	1	3	1
338	1644394	NB	45287.55664	2291	36	2	Female	27-12-23	1	1	0	2	1
339	1649360	GK	45297.96874	37 2024	18	1	Female	05-01-24	0	0	0	0	0
340	1649893	AK	45299.6755	49	37	2	Female	08-01-24	1	1	1	3	1
341	1651522	Ud	45462.6235	1066	30	2	Female	19-06-24	0	0	0	0	0
342	1653699	JB	45307.67887	67	22	2	Male	16-01-24	0	0	0	0	0
343	1653867	PKA	45307.67907	324	32	2	Male	16-01-24	0	0	0	0	0
344	1653968	HK	45461.48222	1057	35	2	Female	18-06-24	0	0	0	0	0
345	1663897	S	45353.50323	387	22	2	Female	02-03-24	0	0	0	0	0
346	1675970	R	45411.44586	744	34	2	Female	29-04-24	0	0	0	0	0
347	1681454	SK	45349.56406	345	26	2	Female	27-02-24	0	0	0	0	0
348	1686148	DS	45356.47191	400	67	4	Male	05-03-24	0	0	0	0	0
349	1686336	HS	45356.49615	405	19	1	Male	05-03-24	0	0	0	0	0
350	1687627	Mj	45357.66583	414	47	3	Female	06-03-24	1	1	1	3	1
351	1688736	Kk	45359.57444	422	30	2	Female	08-03-24	0	0	0	0	0
352	1690338	RK	45362.46995	440	45	3	Female	11-03-24	0	0	0	0	0
353	1691432	KS	45363.54163	450	13	1	Female	12-03-24	1	0	1	2	1
354	1696044	ASS	45369.62459	506	11	1	Male	18-03-24	0	0	1	1	0
355	1696587	Js	45370.72701	512	37	2	Male	18-03-24	0	0	0	0	0
356	1699040	Gk	45373.67168	524	16	1	Female	22-03-24	0	0	0	0	0
357	1699141	Gs	45386.64701	608	55	3	Male	04-04-24	1	0	1	2	1
358	1699432	SA	45378.51661	544	62	4	Female	27-03-24	1	0	0	1	0
359	1699453	Gs	45386.64779	610	59	3	Male	04-04-24	0	0	0	0	0
360	1700311	M	45439.58455	127	19	1	Female	27-05-24	0	1	0	1	0
361	1700781	Au	45377.59822	523	15	1	Male	24-03-24	0	0	1	1	0
362	1701368	Ps	45378.57769	541	40	2	Male	27-03-24	1	0	0	1	0
363	1701421	JS	45378.46436	543	55	3	Male	27-03-24	0	0	0	0	0
364	1701875	PM	45378.71115	544	29	2	Male	27-03-24	1	0	0	1	0
365	1703550	Hk	45380.61553	568	58	3	Female	29/03/0024	1	0	0	1	0
366	1703573	C	45380.65352	578	21	2	Male	29-03-24	1	0	0	1	0
367	1707607	D	45386.4238	604	17	1	Female	04-04-24	0	0	0	0	0
368	1708258	Cm	45462.55603	1270	19	1	Male	19-06-24	0	0	0	0	0
369	1712712	Mlc	45429.69081	871	69	4	Male	17-05-24	0	1	0	1	0
370	1716383	P	45497.84633	-	30	2	Female	12-06-24	0	0	0	0	0
371	1719252	Gk	45441.78103	944	65	4	Female	29-05-24	0	0	0	0	0
372	1721220	Vk	45434.60494	903	39	2	Male	22-05-24	0	0	0	0	0
373	1722398	MK	45498.62868	761	38	2	Female	25-07-24	0	0	0	0	0
374	1722399	RC	45498.63354	762	10	1	Male	25-07-24	0	0	0	0	0
375	1722400	AS	45498.63473	763	47	3	Male	25-07-24	0	0	0	0	0
376	1722401	M	45498.63541	764	20	1	Female	25-07-24	0	0	1	1	0
377	1722402	R	45498.63755	765	25	2	Female	25-07-24	0	0	0	0	0
378	1722403	LS	45498.63865	766	29	2	Male	25-07-24	0	0	1	1	0
379	1722404	UKS	45498.64325	767	34	2	Female	25-07-24	1	0	0	1	0
380	1722405	JK	45498.64403	768	40	2	Female	25-07-24	0	0	1	1	0
381	1722406	SK	45498.64534	769	41	3	Male	25-07-24	0	0	0	0	0
382	1722407	SK	45498.64634	770	50	3	Female	25-07-24	0	0	0	0	0
383	1722408	SS	45498.78692	771	45	3	Male	25-07-24	0	0	1	1	0
384	1722409	HS	45498.79192	772	26	2	Male	25-07-24	0	1	0	1	0
385	1722410	AS	45498.79271	773	30	2	Male	25-07-24	0	0	1	1	0
386	1722411	P	45498.79366	774	36	2	Female	25-07-24	1	0	0	1	0
387	1722412	AK	45498.79454	775	40	2	Male	25-07-24	1	1	1	3	1
388	1722413	RC	45498.88156	776	56	3	Male	25-07-24	1	1	0	2	1
389	1722414	G	45498.88238	777	31	2	Male	25-07-24	0	0	1	1	0
390	1722415	MK	45498.88311	778	30	2	Female	25-07-24	0	1	0	1	0
391	1722416	SK	45498.88384	779	17	1	Female	25-07-24	0	0	0	0	0
392	1722417	SKS	45498.88456	780	46	3	Male	25-07-24	0	1	0	1	0

S No.	MRD No.	Initials	Is there any family history of migrainous headache ?	If answer to previous question is 'Yes', kindly specify in whom ?	Was there any headache in last 3 days ?	Duration of headache ?	Have you ever experienced similar kind of headache before ?	What was the severity of headache ?	Was the onset of headache after EEG test ?	Did you require any medicine for relief from headache ?
337	1641211	A	No	-	Yes	Hours	No	-	No	No
338	1644394	NB	No	-	No	-	No	-	No	No
339	1649360	GK	Yes	Sister	No	-	No	-	No	No
340	1649893	AK	Yes	Mother	No	-	No	1	Yes	Yes
341	1651522	Ud	No	-	No	-	No	-	No	No
342	1653699	JB	Yes	Father	No	-	No	2	No	No
343	1653867	PKA	Yes	Mother	-	-	-	-	-	-
344	1653968	HK	No	-	No	-	No	-	No	No
345	1663897	S	No	-	No	-	No	-	No	No
346	1675970	R	No	-	No	-	No	-	No	No
347	1681454	SK	No	-	No	-	No	-	No	No
348	1686148	DS	No	-	No	-	No	-	No	No
349	1686336	HS	No	-	No	-	No	-	No	No
350	1687627	Mj	Yes	Others	No	-	No	-	No	No
351	1688736	Kk	No	-	No	-	No	-	No	No
352	1690338	RK	No	-	-	-	-	-	-	-
353	1691432	KS	Yes	Father	No	-	No	-	No	No
354	1696044	ASS	Yes	Mother	-	-	-	-	-	-
355	1696587	Js	No	-	-	-	-	-	-	-
356	1699040	Gk	No	-	No	-	No	-	No	No
357	1699141	Gs	No	-	-	-	-	-	-	-
358	1699432	SA	No	-	No	-	No	-	No	No
359	1699453	Gs	No	-	No	-	No	-	No	No
360	1700311	M	No	-	No	-	No	-	No	No
361	1700781	Au	No	-	No	No	No	-	No	No
362	1701368	Ps	No	-	No	No	No	-	No	No
363	1701421	JS	No	-	-	-	-	-	-	-
364	1701875	PM	No	-	No	-	Yes	6	No	No
365	1703550	Hk	No	-	No	-	No	-	No	No
366	1703573	C	No	-	-	-	-	-	-	-
367	1707607	D	No	-	No	-	No	-	No	No
368	1708258	Cm	Yes	Mother	No	-	No	-	No	No
369	1712712	Mlc	No	-	-	-	-	-	-	-
370	1716383	P	No	-	No	-	No	-	No	No
371	1719252	Gk	No	-	No	-	No	-	No	No
372	1721220	Vk	No	-	-	-	-	-	-	-
373	1722398	MK	No	-	-	-	-	-	-	-
374	1722399	RC	No	-	No	-	No	-	No	No
375	1722400	AS	No	-	No	-	No	-	No	No
376	1722401	M	No	-	No	-	No	-	No	No
377	1722402	R	No	-	No	-	No	-	No	No
378	1722403	LS	Yes	Mother	No	-	No	-	No	No
379	1722404	UKS	Yes	Mother	No	-	No	-	No	No
380	1722405	JK	No	-	No	-	No	-	No	No
381	1722406	SK	No	-	No	-	No	-	No	No
382	1722407	SK	No	-	No	-	No	-	No	No
383	1722408	SS	Yes	Brother	No	-	No	-	No	No
384	1722409	HS	Yes	Father	No	No	No	-	No	No
385	1722410	AS	No	-	No	-	No	-	No	No
386	1722411	P	Yes	Mother	No	-	No	-	No	No
387	1722412	AK	No	-	No	No	No	-	No	No
388	1722413	RC	No	-	No	-	No	-	No	No
389	1722414	G	No	-	No	-	No	-	No	No
390	1722415	MK	No	-	No	-	No	-	No	No
391	1722416	SK	No	-	No	-	No	-	No	No
392	1722417	SKS	No	-	No	-	No	-	No	No

S No.	MRD No.	Initials	Timestamp	EEG ID	Age	AGE GROUP	Sex	Date	Has the headache limited your activities for a day or more in the last three months?	Are you nauseated / sick to your stomach when you have a headache?	Does light bother you when you have a headache?	SCORE	Migrane
393	1722418	SD	45498.92192	781	66	4	Female	25-07-24	0	0	0	0	0
394	1722419	SK	45498.95617	782	50	3	Male	25-07-24	0	0	0	0	0
395	1722420	RK	45498.95688	783	45	3	Male	25-07-24	0	0	0	0	0
396	1722421	KB	45498.95778	784	43	3	Male	25-07-24	0	0	0	0	0
397	1722422	AB	45498.95929	785	16	1	Male	25-07-24	1	0	0	1	0
398	1722423	RK	45498.96044	786	39	2	Male	25-07-24	0	0	0	0	0
399	1722424	RP	45498.96131	787	27	2	Male	25-07-24	1	0	1	2	1
400	1722425	SK	45498.96248	788	48	3	Male	25-07-24	0	0	0	0	0
401	1722426	EK	45498.96354	789	27	2	Female	25-07-24	0	0	0	0	0
402	1722427	S	45498.96443	790	34	2	Male	25-07-24	0	0	1	1	0
403	1722428	SP	45498.96566	791	47	3	Female	25-07-24	1	0	0	1	0
404	1722429	BS	45499.6644	792	20	1	Male	26-07-24	0	0	0	0	0
405	1722430	RKS	45499.66517	793	40	2	Male	26-07-24	0	0	0	0	0
406	1722431	KS	45499.66597	794	32	2	Male	26-07-24	1	0	1	2	1
407	1722432	KJ	45499.66683	795	14	1	Female	26-07-24	0	0	0	0	0
408	1722433	SS	45499.66765	796	40	2	Male	26-07-24	0	1	0	1	0
409	1722434	RK	45499.66841	797	18	1	Female	26-07-24	0	0	0	0	0
410	1722435	MM	45499.66941	798	33	2	Male	26-07-24	0	0	0	0	0
411	1722436	KK	45499.67127	799	34	2	Female	26-07-24	0	0	0	0	0
412	1722437	R	45499.67216	800	35	2	Male	26-07-24	0	1	0	1	0
413	1722438	A	45499.67329	801	11	1	Male	26-07-24	0	0	0	0	0
414	1722439	SD	45499.67493	802	39	2	Female	26-07-24	0	0	1	1	0
415	1722440	KK	45499.67593	803	23	2	Female	26-07-24	0	0	1	1	0
416	1722441	VK	45499.67752	804	17	1	Female	26-07-24	0	0	0	0	0
417	1722442	SS	45499.67899	805	39	2	Male	26-07-24	1	1	1	3	1
418	1722443	YS	45499.67984	806	14	1	Male	26-07-24	0	0	0	0	0
419	1722444	RS	45499.6806	807	22	2	Male	26-07-24	0	0	0	0	0
420	1722445	JSK	45499.68179	808	44	3	Male	26-07-24	0	0	0	0	0
421	1722446	GS	45499.6826	809	29	2	Male	26-07-24	1	0	1	2	1
422	1722447	SK	45499.68328	810	26	2	Female	26-07-24	0	0	0	0	0
423	1722448	RS	45499.68405	811	45	3	Male	26-07-24	1	1	1	3	1
424	1722449	T	45499.685	812	10	1	Female	26-07-24	0	0	0	0	0
425	1722450	DS	45499.68571	813	33	2	Male	26-07-24	1	0	0	1	0
426	1722451	P	45499.68669	814	27	2	Male	26-07-24	0	0	0	0	0
427	1722452	MK	45499.68804	815	16	1	Female	26-07-24	0	0	1	1	0
428	1722453	DM	45499.69052	816	14	1	Male	26-07-24	0	0	1	1	0
429	1722454	D	45499.69115	817	17	1	Male	26-07-24	0	0	0	0	0
430	1722455	KRM	45499.69206	818	41	3	Male	26-07-24	1	1	0	2	1
431	1722456	SM	45499.69303	819	9	1	Female	26-07-24	0	0	0	0	0
432	1722457	TS	45499.69622	820	39	2	Male	26-07-24	0	0	0	0	0
433	1722458	SS	45499.69701	821	13	1	Female	26-07-24	0	0	1	1	0
434	1722459	MS	45499.69773	822	24	2	Female	26-07-24	0	0	0	0	0
435	1722460	P	45499.80248	823	23	2	Male	26-07-24	0	0	0	0	0
436	1722461	HC	45499.80332	824	34	2	Male	26-07-24	1	1	1	3	1
437	1722462	N	45499.80396	825	15	1	Female	26-07-24	0	1	1	2	1
438	1722463	SS	45499.80492	826	44	3	Male	26-07-24	1	0	1	2	1
439	1722464	PA	45499.80579	827	29	2	Female	26-07-24	0	1	0	1	0
440	1722465	HK	45499.80674	828	23	2	Female	26-07-24	0	1	1	2	1
441	1722466	BK	45499.80766	829	31	2	Female	26-07-24	0	0	0	0	0
442	1722467	HS	45499.80872	830	15	1	Male	26-07-24	0	0	1	1	0
443	1722468	BS	45499.80947	831	19	1	Male	26-07-24	0	0	0	0	0
444	1722469	SH	45499.81192	832	25	2	Male	26-07-24	0	1	1	2	1
445	1722470	KK	45499.81284	833	24	2	Female	26-07-24	0	1	0	1	0
446	1722471	BS	45499.81561	834	45	3	Male	26-07-24	0	0	0	0	0
447	1722472	MS	45499.81619	835	23	2	Male	26-07-24	1	1	0	2	1
448	1722473	AL	45499.81686	836	33	2	Female	26-07-24	0	0	0	0	0

S No.	MRD No.	Initials	Is there any family history of migrainous headache ?	If answer to previous question is 'Yes', kindly specify in whom ?	Was there any headache in last 3 days ?	Duration of headache ?	Have you ever experienced similar kind of headache before ?	What was the severity of headache ?	Was the onset of headache after EEG test ?	Did you require any medicine for relief from headache ?
393	1722418	SD	No	-	No	-	No	-	No	No
394	1722419	SK	No	-	No	-	No	-	No	No
395	1722420	RK	No	-	No	-	No	-	No	No
396	1722421	KB	No	-	No	-	No	-	No	No
397	1722422	AB	No	-	No	-	No	-	No	No
398	1722423	RK	No	-	No	-	No	-	No	No
399	1722424	RP	No	-	No	-	No	-	No	No
400	1722425	SK	No	-	No	-	No	-	No	No
401	1722426	EK	Yes	Mother	No	-	No	-	No	No
402	1722427	S	No	-	No	-	No	-	No	No
403	1722428	SP	No	-	No	-	No	-	No	No
404	1722429	BS	Yes	Mother	No	-	No	-	No	No
405	1722430	RKS	No	-	No	-	No	-	No	No
406	1722431	KS	No	-	No	-	No	-	No	No
407	1722432	KJ	No	-	No	-	No	-	No	No
408	1722433	SS	No	-	No	-	No	-	No	No
409	1722434	RK	No	-	No	-	No	-	No	No
410	1722435	MM	No	-	No	-	No	-	No	No
411	1722436	KK	No	-	No	-	No	-	No	No
412	1722437	R	Yes	Brother	No	No	No	No	No	No
413	1722438	A	No	-	No	-	No	-	No	No
414	1722439	SD	No	-	No	-	No	-	No	No
415	1722440	KK	Yes	Mother	No	-	No	-	No	No
416	1722441	VK	No	-	No	-	No	-	No	No
417	1722442	SS	No	-	Yes	Hours	Yes	4	Yes	No
418	1722443	YS	Yes	Father	No	-	No	-	No	No
419	1722444	RS	No	-	No	-	No	-	No	No
420	1722445	JSK	Yes	Son	No	-	No	-	No	No
421	1722446	GS	No	-	No	-	No	0	No	No
422	1722447	SK	No	-	No	-	No	-	No	No
423	1722448	RS	Yes	Mother	No	No	No	-	No	No
424	1722449	T	No	-	No	-	No	-	No	No
425	1722450	DS	Yes	Father	No	-	No	-	No	No
426	1722451	P	No	-	No	-	No	-	No	No
427	1722452	MK	Yes	Mother	No	-	No	-	No	No
428	1722453	DM	No	-	No	-	No	-	No	No
429	1722454	D	No	-	No	-	No	-	No	No
430	1722455	KRM	No	-	No	No	No	-	No	No
431	1722456	SM	Yes	Father	No	-	No	-	No	No
432	1722457	TS	No	-	No	-	No	-	No	No
433	1722458	SS	Yes	Mother	No	-	No	-	No	No
434	1722459	MS	No	-	No	-	No	-	No	No
435	1722460	P	No	-	No	-	No	-	No	No
436	1722461	HC	Yes	Mother	No	-	No	-	No	No
437	1722462	N	No	-	No	-	No	-	No	No
438	1722463	SS	No	-	No	-	No	-	No	No
439	1722464	PA	No	-	No	-	No	-	No	No
440	1722465	HK	Yes	Mother	Yes	Minutes	Yes	2	No	No
441	1722466	BK	No	-	No	-	No	-	No	No
442	1722467	HS	No	-	No	-	No	-	No	No
443	1722468	BS	No	-	No	-	No	-	No	No
444	1722469	SH	No	-	No	-	No	-	No	No
445	1722470	KK	Yes	Father	No	-	No	-	No	No
446	1722471	BS	No	-	No	-	No	-	No	No
447	1722472	MS	No	-	No	-	No	-	No	No
448	1722473	AL	Yes	Others	No	-	No	-	No	No

S No.	MRD No.	Initials	Timestamp	EEG ID	Age	AGE GROUP	Sex	Date	Has the headache limited your activities for a day or more in the last three months?	Are you nauseated / sick to your stomach when you have a headache?	Does light bother you when you have a headache?	SCORE	Migrane
449	1722474	MJ	45499.81755	837	38	2	Female	26-07-24	0	1	0	1	0
450	1722475	S	45499.81831	838	11	1	Male	26-07-24	0	0	0	0	0
451	1722476	SS	45499.81904	839	56	3	Male	26-07-24	0	0	0	0	0
452	1722477	NK	45499.81983	840	28	2	Female	26-07-24	1	0	0	1	0
453	1722478	AK	45499.82054	841	21	2	Female	26-07-24	0	0	0	0	0
454	1722479	AJ	45499.82191	842	30	2	Male	26-07-24	0	0	1	1	0
455	1722480	JS	45499.84741	843	31	2	Male	26-07-24	0	0	0	0	0
456	1722481	SK	45499.84851	844	29	2	Male	26-07-24	0	0	0	0	0
457	1722482	P	45499.84927	845	28	2	Female	26-07-24	0	0	0	0	0
458	1722483	RS	45499.85058	846	36	2	Male	26-07-24	0	0	0	0	0
459	1722484	JK	45499.85126	847	41	3	Female	26-07-24	0	0	1	1	0
460	1722485	AG	45499.85426	848	12	1	Male	26-07-24	0	0	0	0	0
461	1722486	AS	45499.85497	849	25	2	Male	26-07-24	1	0	0	1	0
462	1722487	HT	45499.85563	850	26	2	Male	26-07-24	0	0	0	0	0
463	1722488	PS	45499.85973	851	24	2	Male	26-07-24	0	0	0	0	0
464	1722489	JK	45499.86051	852	19	1	Female	26-07-24	0	1	0	1	0
465	1722490	BR	45499.86123	853	33	2	Female	26-07-24	0	0	0	0	0
466	1722491	JS	45499.86266	854	37	2	Male	26-07-24	1	1	1	3	1
467	1722492	GS	45499.86329	855	29	2	Male	26-07-24	0	1	0	1	0
468	1722493	SK	45499.86402	856	21	2	Female	26-07-24	0	0	0	0	0
469	1722494	JS	45499.86649	857	13	1	Male	26-07-24	0	0	1	1	0
470	1722495	HK	45499.86748	858	14	1	Female	26-07-24	0	1	0	1	0
471	1722496	HK	45499.868	859	21	2	Male	26-07-24	0	0	0	0	0
472	1722497	MJ	45499.86897	860	27	2	Female	26-07-24	0	0	0	0	0
473	1722498	AS	45499.87016	861	19	1	Male	26-07-24	0	1	0	1	0
474	1722499	A	45499.87192	862	26	2	Male	26-07-24	0	1	0	1	0
475	1722500	MK	45499.87435	863	59	3	Female	26-07-24	0	0	0	0	0
476	1722501	RS	45499.87532	864	21	2	Female	26-07-24	0	1	1	2	1
477	1722502	VB	45499.87965	865	24	2	Female	26-07-24	0	0	0	0	0
478	1722503	DS	45499.88071	866	28	2	Male	26-07-24	0	0	1	1	0
479	1722504	HS	45499.8824	867	46	3	Male	26-07-24	0	0	1	1	0
480	1722505	AK	45499.88426	868	25	2	Female	26-07-24	0	0	1	1	0
481	1722506	JS	45499.88506	869	43	3	Male	26-07-24	1	0	0	1	0
482	1722507	MLG	45499.88574	870	32	2	Male	26-07-24	0	0	1	1	0
483	1722508	AS	45499.88648	871	27	2	Male	26-07-24	0	0	0	0	0
484	1722509	MA	45499.88718	872	21	2	Male	26-07-24	1	0	0	1	0
485	1722510	KS	45499.888	873	32	2	Female	26-07-24	0	0	0	0	0
486	1722511	HS	45499.88889	874	22	2	Male	26-07-24	0	0	0	0	0
487	1722512	PK	45499.88958	875	34	2	Female	26-07-24	0	0	0	0	0
488	1722513	SR	45499.89045	876	45	3	Female	26-07-24	1	0	0	1	0
489	1722514	MS	45499.89106	877	26	2	Male	26-07-24	0	1	0	1	0
490	1722515	KK	45499.8919	878	15	1	Female	26-07-24	0	0	0	0	0
491	1722516	DS	45499.8926	879	39	2	Male	26-07-24	1	0	0	1	0
492	1722517	JA	45499.89387	880	32	2	Male	26-07-24	1	1	0	2	1
493	1722518	PG	45499.89475	881	28	2	Female	26-07-24	0	0	1	1	0
494	1722519	N	45499.97509	882	16	1	Male	26-07-24	0	0	1	1	0
495	1722520	HS	45499.97575	883	34	2	Male	26-07-24	1	1	1	3	1
496	1722521	AR	45499.97652	884	26	2	Male	26-07-24	0	0	1	1	0
497	1722522	BK	45499.97718	885	45	3	Female	26-07-24	0	1	0	1	0
498	1722523	KA	45499.97793	886	30	2	Male	26-07-24	0	0	0	0	0
499	1722524	S	45499.97867	887	12	1	Female	26-07-24	1	0	0	1	0
500	1722525	MS	45499.97947	888	31	2	Male	26-07-24	0	1	0	1	0
501	1722526	HS	45500.46951	889	34	2	Male	26-07-24	0	0	0	0	0
502	1722527	M	45500.47031	890	14	1	Female	27-07-24	1	0	0	1	0
503	1722528	SB	45500.47106	891	29	2	Male	27-07-24	1	1	1	3	1
504	1722529	SS	45500.47188	892	19	1	Male	27-07-24	0	0	1	1	0

S No.	MRD No.	Initials	Is there any family history of migrainous headache ?	If answer to previous question is 'Yes', kindly specify in whom ?	Was there any headache in last 3 days ?	Duration of headache ?	Have you ever experienced similar kind of headache before ?	What was the severity of headache ?	Was the onset of headache after EEG test ?	Did you require any medicine for relief from headache ?
449	1722474	MJ	No	-	No	-	No	-	No	No
450	1722475	S	No	-	No	-	No	-	No	No
451	1722476	SS	No	-	No	-	No	-	No	No
452	1722477	NK	No	-	No	-	No	-	No	No
453	1722478	AK	Yes	Others	No	-	No	-	No	No
454	1722479	AJ	Yes	Mother	Yes	Hours	Yes	4	Yes	Yes
455	1722480	JS	No	-	No	-	No	-	No	No
456	1722481	SK	No	-	No	-	No	-	No	No
457	1722482	P	No	-	No	-	No	-	No	No
458	1722483	RS	No	-	No	-	No	-	No	No
459	1722484	JK	No	-	No	-	No	-	No	No
460	1722485	AG	No	-	No	-	No	-	No	No
461	1722486	AS	Yes	Sister	No	-	No	-	No	No
462	1722487	HT	No	-	No	-	No	-	No	No
463	1722488	PS	No	-	No	-	No	-	No	No
464	1722489	JK	No	-	No	-	No	-	No	No
465	1722490	BR	No	-	No	-	No	-	No	No
466	1722491	JS	No	-	No	-	No	-	No	No
467	1722492	GS	No	-	No	-	No	-	No	No
468	1722493	SK	Yes	Sister	No	-	No	-	No	No
469	1722494	JS	No	-	No	-	No	-	No	No
470	1722495	HK	No	-	No	-	No	-	No	No
471	1722496	HK	Yes	Mother	No	-	No	-	No	No
472	1722497	MJ	No	-	No	-	No	-	No	No
473	1722498	AS	No	-	No	-	No	-	No	No
474	1722499	A	No	-	No	-	No	-	No	No
475	1722500	MK	No	-	No	-	No	-	No	No
476	1722501	RS	No	-	Yes	Minutes	Yes	0	No	No
477	1722502	VB	Yes	Mother	No	-	No	-	No	No
478	1722503	DS	Yes	-	No	-	No	-	No	No
479	1722504	HS	No	-	No	-	No	-	No	No
480	1722505	AK	Yes	Mother	No	-	No	-	No	No
481	1722506	JS	No	-	No	-	No	-	No	No
482	1722507	MLG	No	-	No	-	No	-	No	No
483	1722508	AS	Yes	Others	No	-	No	-	No	No
484	1722509	MA	No	-	No	-	No	-	No	No
485	1722510	KS	No	-	No	-	No	-	No	No
486	1722511	HS	No	-	No	-	No	-	No	No
487	1722512	PK	No	-	No	-	No	-	No	No
488	1722513	SR	Yes	Mother	Yes	Minutes	Yes	2	Yes	Yes
489	1722514	MS	No	-	No	-	No	-	No	No
490	1722515	KK	No	-	No	-	No	-	No	No
491	1722516	DS	No	-	No	-	No	-	No	No
492	1722517	JA	Yes	Sister	No	-	No	-	No	No
493	1722518	PG	No	-	No	-	No	-	No	No
494	1722519	N	Yes	Father	No	-	No	-	No	No
495	1722520	HS	No	-	No	-	No	-	No	No
496	1722521	AR	No	-	No	-	No	-	No	No
497	1722522	BK	Yes	Daughter	No	-	No	-	No	No
498	1722523	KA	No	-	No	-	No	-	No	No
499	1722524	S	No	-	No	-	No	-	No	No
500	1722525	MS	No	-	No	-	No	-	No	No
501	1722526	HS	No	-	No	-	No	-	No	No
502	1722527	M	Yes	Mother	No	-	No	-	No	No
503	1722528	SB	Yes	Father	No	-	No	-	No	No
504	1722529	SS	No	-	No	-	No	-	No	No

S No.	MRD No.	Initials	Timestamp	EEG ID	Age	AGE GROUP	Sex	Date	Has the headache limited your activities for a day or more in the last three months?	Are you nauseated / sick to your stomach when you have a headache?	Does light bother you when you have a headache?	SCORE	Migrane
505	1722530	S	45500.47256	893	21	2	Female	27-07-24	0	1	1	2	1
506	1722531	AM	45500.47321	894	32	2	Male	27-07-24	1	0	0	1	0
507	1723383	Sr	45411.55813	746	51	3	Female	29-04-24	1	0	0	1	0
508	1723384	GS	45498.56447	747	50	3	Male	25-07-24	0	0	0	0	0
509	1723385	BK	45498.57015	748	50	3	Female	25-07-24	0	0	0	0	0
510	1723386	KV	45498.57707	749	30	2	Male	25-07-24	0	0	1	1	0
511	1723387	PK	45498.57872	750	46	3	Female	25-07-24	0	0	0	0	0
512	1723388	GK	45498.58544	751	44	3	Female	25-07-24	0	0	0	0	0
513	1723389	AS	45498.58734	752	25	2	Male	25-07-24	0	0	0	0	0
514	1723390	MK	45498.59124	753	30	2	Female	25-07-24	0	0	0	0	0
515	1723391	P	45498.59352	754	42	3	Female	25-07-24	0	0	0	0	0
516	1723392	UK	45498.5959	755	44	3	Female	25-07-24	0	0	0	0	0
517	1723393	VD	45498.59751	756	35	2	Male	25-07-24	0	0	0	0	0
518	1723394	SG	45498.61696	757	29	2	Female	25-07-24	0	0	0	0	0
519	1723395	GK	45498.61872	758	60	3	Female	25-07-24	0	0	0	0	0
520	1723396	RB	45498.62106	759	14	1	Male	25-07-24	0	0	0	0	0
521	1723397	MS	45498.62714	760	40	2	Male	25-07-24	0	0	0	0	0
522	1723449	Vs	45411.73644	749	16	1	Male	12-06-08	0	0	0	0	0
523	1723729	SS	45499.52575	1015	23	2	Female	26-07-24	1	1	1	3	1
524	1723831	Js	45412.53303	755	16	1	Male	30-04-24	0	0	0	0	0
525	1723912	BS	45427.46625	853	71	4	Male	15-05-53	0	0	0	0	0
526	1723976	Rk	45412.46613	752	31	2	Female	30-04-24	0	0	0	0	0
527	1724043	S	45412.74807	760	17	1	Female	30-04-24	0	1	0	1	0
528	1724697	Ss	45413.54139	762	37	2	Male	01-05-24	0	0	0	0	0
529	1725223	R	45414.47999	769	19	1	Female	02-05-24	1	0	0	1	0
530	1725819	Ms	45439.70513	931	43	3	Male	27-05-24	0	0	0	0	0
531	1728013	Js	45418.46859	783	35	2	Male	06-05-24	1	0	1	2	1
532	1728700	BR	45419.46927	790	34	2	Female	07-05-24	1	1	0	2	1
533	1728741	HK	45419.54135	792	23	2	Female	07-05-24	1	1	1	3	1
534	1729109	JV	45420.62109	800	13	1	Female	22-05-11	0	0	0	0	0
535	1729315	Rk	45420.61356	789	56	3	Male	13-02-67	1	0	0	1	0
536	1730004	Ks	45421.44999	806	18	1	Male	16-09-06	0	0	1	1	0
537	1730021	SC	45421.49292	807	55	3	Male	09-05-24	0	0	0	0	0
538	1730022	SC	45430.51087	873	55	3	Male	12-05-24	0	0	0	0	0
539	1730114	SS	45421.63297	809	42	3	Male	09-05-24	0	0	0	0	0
540	1730350	Ks	45422.415	815	24	2	Male	10-05-24	0	0	0	0	0
541	1732133	E	45439.44022	922	11	1	Male	27-05-24	0	0	0	0	0
542	1732169	BS	45439.50707	881	43	3	Male	27-05-24	0	0	0	0	0
543	1732456	A	45439.54844	890	27	2	Female	23-05-24	0	0	0	0	0
544	1732469	BS	45432.43075	882	43	3	Male	20-05-24	0	0	0	0	0
545	1732598	PG	45425.60257	842	22	2	Female	13-05-24	0	0	0	0	0
546	1732984	Hs	45425.59368	837	25	2	Male	13-05-24	0	0	1	1	0
547	1733088	N	45425.7133	840	21	2	Female	13-05-24	0	0	1	1	0
548	1733453	SK	45426.69513	847	29	2	Female	14-05-24	0	0	1	1	0
549	1733822	S	45426.67575	848	32	2	Female	14-07-91	0	1	0	1	0
550	1735768	HS	45429.57402	868	26	2	Male	17-05-24	0	1	0	1	0
551	1736181	RK	45430.56015	873	70	4	Female	18-05-24	0	1	0	1	0
552	1736285	Gs	45430.62039	874	57	3	Male	18-05-24	0	0	0	0	0
553	1736550	AK	45499.05558	879	17	1	Male	25-07-24	0	0	0	0	0
554	1737157	JK	45432.54237	884	15	1	Female	20-05-24	1	0	1	2	1
555	1737355	HS	45439.69413	889	18	1	Male	20-05-24	0	0	0	0	0
556	1738246	Sk	45434.45163	895	29	2	Female	22-05-24	0	1	0	1	0
557	1738370	Rd	45442.53301	949	34	2	Female	30-05-24	1	0	0	1	0
558	1739033	I	45434.8214	905	23	2	Male	22-05-24	0	0	1	1	0
559	1739146	Js	45435.48218	807	31	2	Male	23-05-24	0	0	0	0	0
560	1739261	Nk	45435.46397	806	35	2	Female	18-01-89	0	0	0	0	0

S No.	MRD No.	Initials	Is there any family history of migrainous headache ?	If answer to previous question is 'Yes', kindly specify in whom ?	Was there any headache in last 3 days ?	Duration of headache ?	Have you ever experienced similar kind of headache before ?	What was the severity of headache ?	Was the onset of headache after EEG test ?	Did you require any medicine for relief from headache ?
505	1722530	S	Yes	Mother	No	-	No	-	No	No
506	1722531	AM	No	-	No	-	No	-	No	No
507	1723383	Sr	No	-	No	-	No	-	No	No
508	1723384	GS	No	-	No	-	No	-	No	No
509	1723385	BK	Yes	Others	No	-	No	-	No	No
510	1723386	KV	No	-	No	-	No	-	No	No
511	1723387	PK	No	-	No	-	No	-	No	No
512	1723388	GK	No	-	No	-	No	-	No	No
513	1723389	AS	No	-	No	-	No	-	No	No
514	1723390	MK	No	-	No	-	No	-	No	No
515	1723391	P	No	-	No	-	No	-	No	No
516	1723392	UK	No	-	No	-	No	-	No	No
517	1723393	VD	No	-	No	-	No	-	No	No
518	1723394	SG	No	-	No	-	No	-	No	No
519	1723395	GK	Yes	Sister	No	-	No	-	No	No
520	1723396	RB	No	-	No	-	No	-	No	No
521	1723397	MS	No	-	No	-	No	-	No	No
522	1723449	Vs	Yes	Mother	No	-	No	-	No	No
523	1723729	SS	Yes	Mother	No	-	No	-	No	No
524	1723831	Js	Yes	Mother	No	-	No	-	No	No
525	1723912	BS	No	-	No	-	No	-	No	No
526	1723976	Rk	No	-	No	-	No	-	No	No
527	1724043	S	No	-	No	-	No	-	No	No
528	1724697	Ss	No	-	No	-	No	-	No	No
529	1725223	R	No	-	-	-	-	-	-	-
530	1725819	Ms	No	-	No	-	No	-	No	No
531	1728013	Js	No	-	No	-	No	-	No	No
532	1728700	BR	No	-	No	-	No	-	No	No
533	1728741	HK	No	-	No	-	No	-	No	No
534	1729109	JV	No	-	No	-	No	-	No	No
535	1729315	Rk	No	-	No	-	No	-	No	No
536	1730004	Ks	Yes	Father	No	-	No	-	No	No
537	1730021	SC	No	-	-	-	-	-	-	-
538	1730022	SC	No	-	No	-	No	-	No	No
539	1730114	SS	No	-	-	-	-	-	-	-
540	1730350	Ks	No	-	No	-	No	-	No	No
541	1732133	E	No	-	No	Minutes	No	-	No	No
542	1732169	BS	No	-	No	No	No	-	No	No
543	1732456	A	No	-	No	-	No	-	No	No
544	1732469	BS	No	-	No	-	No	-	No	No
545	1732598	PG	Yes	Mother	No	-	No	-	No	No
546	1732984	Hs	No	-	No	-	No	-	No	No
547	1733088	N	No	-	No	-	No	-	No	No
548	1733453	SK	Yes	Sister	No	-	No	-	No	No
549	1733822	S	No	-	No	-	No	-	No	No
550	1735768	HS	No	-	No	-	No	-	No	No
551	1736181	RK	No	-	No	-	No	-	No	No
552	1736285	Gs	No	-	No	-	No	-	No	No
553	1736550	AK	No	-	No	-	No	-	No	No
554	1737157	JK	Yes	Father	No	-	No	-	No	No
555	1737355	HS	No	-	-	-	-	-	-	-
556	1738246	Sk	No	-	No	-	No	-	No	No
557	1738370	Rd	No	-	No	-	No	-	No	No
558	1739033	I	Yes	Mother	No	-	No	-	No	No
559	1739146	Js	No	-	No	-	No	-	No	No
560	1739261	Nk	No	-	No	-	No	-	No	No

S No.	MRD No.	Initials	Timestamp	EEG ID	Age	AGE GROUP	Sex	Date	Has the headache limited your activities for a day or more in the last three months?	Are you nauseated / sick to your stomach when you have a headache?	Does light bother you when you have a headache?	SCORE	Migrane
561	1739530	RG	45435.60015	911	38	2	Male	28-07-85	1	0	0	1	0
562	1739972	Sb	45436.55884	914	52	3	Female	24-05-24	1	0	0	1	0
563	1740964	Gk	45437.76008	981	22	2	Female	25-05-24	0	0	0	0	0
564	1741002	RS	45443.73522	955	13	1	Male	31-05-24	0	0	0	0	0
565	1741580	BS	45439.54197	925	75	4	Male	27-05-24	0	0	0	0	0
566	1742316	A	45440.50362	912	13	1	Female	28-05-24	1	0	0	1	0
567	1742901	SK	45496.48155	988	26	2	Female	29-05-24	0	0	1	1	0
568	1743519	JS	45442.44272	-	16	1	Male	30-05-24	0	1	0	1	0
569	1744098	SK	45448.59948	982	29	2	Female	05-06-24	1	1	0	2	1
570	1745677	AK	45446.5827	967	15	1	Male	03-06-24	0	0	0	0	0
571	1745732	Ts	45446.62189	970	10	1	Male	06-03-24	0	0	0	0	0
572	1747458	Kk	45453.55361	1005	36	2	Female	10-06-24	0	0	0	0	0
573	1747541	GS	45449.52271	-	16	1	Male	06-06-24	0	0	0	0	0
574	1747736	PS	45449.75764	9993	18	1	Male	10-12-05	1	0	0	1	0
575	1748768	SP	45451.46572	1001	20	1	Male	08-06-24	1	1	1	3	1
576	1748958	SSM	45451.66087	1003	36	2	Male	08-06-24	0	0	0	0	0
577	1749157	Ss	45451.75588	1004	28	2	Male	08-06-24	0	0	0	0	0
578	1749649	M	45453.61207	1020	23	2	Female	10-06-24	0	0	0	0	0
579	1751162	N	45499.52668	1020	19	1	Female	26-07-24	0	0	0	0	0
580	1751677	Sk	45456.55903	10282024	18	1	Female	13-06-24	1	0	0	1	0
581	1751789	KS	45456.50935	1029	40	2	Male	13-06-24	1	0	0	1	0
582	1751981	As	45456.61441	1031	38	2	Male	13-06-24	0	0	0	0	0
583	1752000	M	45456.85397	1032	20	1	Male	13-06-24	1	0	1	2	1
584	1752308	Ss	45498.8301	16412024	16	1	Male	09-05-08	0	0	0	0	0
585	1752389	JS	45497.70358	1640 2024	13	1	Male	24-07-24	0	0	0	0	0
586	1752580	Hk	45461.42885	1033	28	2	Female	18-06-24	1	0	0	1	0
587	1754837	Y	45462.58377	1065	12	1	Male	19-06-24	0	0	0	0	0
588	1757139	AS	45465.76541	1110	29	2	Female	22-06-24	0	0	0	0	0
589	1758516	Rs	45468.51956	1105	13	1	Male	25-06-24	1	0	0	1	0
590	1758517	AK	45497.63387	1109	12	1	Male	24-07-24	0	0	0	0	0
591	1758998	Bs	45469.44745	1112	19	1	Male	26-06-24	0	0	1	1	0
592	1759885	PJ	45470.5633	1124	70	4	Female	27-06-24	0	0	0	0	0
593	1760577	Ak	45471.6209	1134	27	2	Male	16-03-97	0	0	0	0	0
594	1761460	Ss	45472.59615	1140	18	1	Male	29-06-24	1	0	0	1	0
595	14488721	DS	45383.39416	552	43	3	Male	01-04-24	0	0	1	1	0
596	17326898	J	45425.56777	834	13	1	Female	13-05-24	0	1	0	1	0
597	17354365	Mk	45429.57039	866	28	2	Male	17-05-24	0	0	0	0	0

S No.	MRD No.	Initials	Is there any family history of migrainous headache ?	If answer to previous question is 'Yes', kindly specify in whom ?	Was there any headache in last 3 days ?	Duration of headache ?	Have you ever experienced similar kind of headache before ?	What was the severity of headache ?	Was the onset of headache after EEG test ?	Did you require any medicine for relief from headache ?
561	1739530	RG	No	-	No	-	No	-	No	No
562	1739972	Sb	No	-	No	-	No	-	No	Yes
563	1740964	Gk	No	-	No	-	No	-	No	No
564	1741002	RS	No	-	No	-	No	-	No	No
565	1741580	BS	No	-	No	-	No	-	No	No
566	1742316	A	Yes	Mother	No	-	No	-	No	No
567	1742901	SK	No	-	No	-	No	-	No	No
568	1743519	JS	No	-	No	-	No	-	No	No
569	1744098	SK	Yes	Mother	No	Days	No	6	Yes	Yes
570	1745677	AK	No	-	No	-	No	-	No	No
571	1745732	Ts	No	-	No	-	No	-	No	No
572	1747458	Kk	No	-	No	-	No	2	No	Yes
573	1747541	GS	No	-	No	-	No	-	No	No
574	1747736	PS	Yes	Father	No	-	No	-	No	No
575	1748768	SP	No	-	No	-	No	-	No	No
576	1748958	SSM	No	-	No	-	No	-	No	No
577	1749157	Ss	Yes	Brother	No	-	No	-	No	No
578	1749649	M	No	-	No	-	No	-	No	No
579	1751162	N	No	-	No	-	No	-	No	No
580	1751677	Sk	No	-	No	-	No	-	No	No
581	1751789	KS	No	-	No	-	No	-	No	No
582	1751981	As	Yes	Mother	No	-	No	-	No	No
583	1752000	M	No	-	No	-	No	-	No	No
584	1752308	Ss	Yes	Mother	No	-	No	-	No	No
585	1752389	JS	Yes	Sister	No	-	Yes	0	No	No
586	1752580	Hk	No	-	No	-	No	-	No	No
587	1754837	Y	No	-	No	-	No	-	No	No
588	1757139	AS	No	-	No	-	No	-	No	No
589	1758516	Rs	Yes	Mother	No	-	No	-	No	No
590	1758517	AK	No	-	No	-	No	-	No	No
591	1758998	Bs	No	-	No	-	No	-	No	No
592	1759885	PJ	No	-	No	-	No	-	No	No
593	1760577	Ak	No	-	No	-	No	-	No	No
594	1761460	Ss	No	-	No	-	No	-	No	No
595	14488721	DS	No	-	No	-	No	-	Yes	Yes
596	17326898	J	Yes	Brother	No	-	No	-	No	No
597	17354365	Mk	Yes	Mother	No	-	Yes	0	No	No

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The Principal
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Ludhiana

Subject:: Approval of Plan of Thesis.

This is to inform you that the Faculty of Medical Sciences in its meeting held on 25.09.2023 has approved the plan of thesis of **Iqbal Singh**, a student of your college for **DM Neurology** along with the names of Supervisor/Co-Supervisor as under:-

Topic Plan of Thesis
To study the prevalence of headache and its characterisation after intermittent photic stimulation in patients undergoing eeg .

Supervisor
Dr. Gagandeep Singh
Prof. & Head
Dept. of Neurology

Co-Supervisor:-
Dr. Monika Singla
Assoc. Professor
Dept. of Neurology

The student may submit the thesis in triplicate alongwith the plan in triplicate also, to the Controller of Examinations, BFUHS, Faridkot, at least six months before the commencement of theory examination, if he/she is otherwise eligible to take the examination. He /She may be directed to attach a photocopy of this letter with the forwarding letter while submitting thesis in the University along with the letter of approval of University for change of supervisor/Co-Supervisor, change of topic, if any.

Controller of Examinations

Note :

1. *If any discrepancy found regarding topic of thesis or Supervisor/Co-Supervisor, inform undersigned within one month after issue of this letter.*

TO STUDY THE PREVALENCE OF HEADACHE AND ITS CHARACTERISATION AFTER INTERMITTENT PHOTIC STIMULATION IN PATIENTS UNDERGOING EEG

THESIS PROPOSAL

FOR APPROVAL OF SUBJECT OF THESIS TO BE SUBMITTED

IN PARTIAL FULFILMENT OF THE REQUIREMENTS

FOR THE DEGREE OF

DOCTOR OF MEDICINE / MASTER OF SURGERY

IN

NEUROLOGY

OF THE

BABA FARID UNIVERSITY OF HEALTH SCIENCES
FARIDKOT

NOVEMBER, 2022

DR. IQBAL SINGH

DEPARTMENT OF NEUROLOGY
DAYANAND MEDICAL COLLEGE AND HOSPITAL
LUDHIANA

ABSTRACT OF PLAN OF THESIS

Title	TO STUDY THE PREVALENCE OF HEADACHE AND ITS CHARACTERISATION AFTER INTERMITTENT PHOTIC STIMULATION IN PATIENTS UNDERGOING EEG.
For the degree of	DM NEUROLOGY
Name of the candidate	Dr. Iqbal Singh
Supervisor	Dr. Gagandeep Singh, Professor & Head, Department of Neurology, Dmch Ludhiana.
Co-supervisor	Dr. Monika Singla, Associate Professor, Department of Neurology, Dmch Ludhiana.
Institution	Dayanand Medical College & Hospital, Ludhiana.
University	Baba Farid University of Health Sciences, Faridkot.

Introduction: Recognition of headache as an epileptic manifestation per se represents a challenge yet.

Aim of Study: To study the prevalence of headache and its characterization after intermittent photic stimulation in patients undergoing EEG.

Materials & methods: Observational study for 1 year period in patients undergoing EEG.

Clinical Significance: The physician should bear this association in mind when dealing with epileptic and migraine patients to be able to offer such patients an accurate diagnosis and appropriate treatment.

Keywords: migraine, epilepsy, post ictal headache, EEG, intermittent photic stimulation.

(Signature)	(Signature)	(Signature)	(Signature)
Candidate	Co-supervisor	Supervisor	Principal

CERTIFICATE OF FACILITIES AVAILABLE

This is to certify that the facilities for work on the subject of thesis titled **"TO STUDY THE PREVALENCE OF HEADACHE AND ITS CHARACTERISATION AFTER INTERMITTENT PHOTIC STIMULATION IN PATIENTS UNDERGOING EEG"** exist in the Department of Neurology, DMC&H, Ludhiana and will be provided to the candidate. We will see that the data being included in the thesis is genuine and is collected by the candidate himself under our supervision and guidance.

Supervisor

Dr. Gagandeep Singh
Professor & Head
Department of Neurology
Dmch, Ludhiana

Co-Supervisor

Dr. Monika Singla
Associate Professor
Department of Neurology
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Head of the Department

Dr. Gagandeep Singh
Professor & Head
Department of Neurology
Dmch, Ludhiana

Place: _____

Date: _____

APPROVAL PROFORMA
BY RESEARCH & ETHICAL COMMITTEE
DAYANAND MEDICAL COLLEGE & HOSPITAL, LUDHIANA

Name of candidate	Dr. Iqbal Singh
Department	Neurology
Topic of Thesis	TO STUDY THE PREVALENCE OF HEADACHE AND ITS CHARACTERISATION AFTER INTERMITTENT PHOTIC STIMULATION IN PATIENTS UNDERGOING EEG.
Likely date of appearing in PG examination	May, 2025
Date of enrollment	29/4/2022
Name of Head of Department	Dr Gagandeep Singh
1) Supervisor **2) Co-Supervisor**	Dr Gagandeep Singh Dr Monika Singla
Signature of Members of Research Committee with Stamp	**Signature of Members of Ethics Committee with Stamp**
Dr. Harpreet Kaur (Professor & Head, Pathology)	Mr. R K Sharma (Legal Expert)
Dr. Jaspal Singh (Professor & Head, Surgery)	Dr. Ramit Mahajan (Associate Professor, Gastroenterology)
Dr. Dinesh Gupta (Professor & Head, Medicine)	Dr. Anu Sharma (Professor, Anatomy)
Dr. Sandeep Kaushal (Dean Academics & Professor & Head, Pharmacology)	Dr. Sandeep Kaushal (Dean Academics & Professor & Head, Pharmacology)
Dr. Gurpreet S Wander (Vice Principal)	Dr. Gurpreet S Wander (Vice Principal & Professor & Head, Cardiology)
	Dr. Gagandeep Singh (Secretary, Ethics Committee Professor & Head, Neurology)

Approved: Yes / No

Dr. Sandeep Puri
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Research Committee

Approved: Yes / No

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Chairperson
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BABA FARID UNIVERSITY OF HEALTH SCIENCES, FARIDKOT

PROFORMA FOR REGISTRATION OF SUBJECT FOR DISSERTATION

1	NAME OF THE CANDIDATE AND ADDRESS	DR. IQBAL SINGH 24-D, RANI KA BAGH, AMRITSAR, PUNJAB
2	NAME OF THE INSTITUTE	DAYANAND MEDICAL COLLEGE AND HOSPITAL
3	COURSE OF STUDY AND SUBJECT	DM NEUROLOGY
4	DATE OF ADMISSION OF COURSE	29/04/2022
5	TITLE OF THE TOPIC	TO STUDY THE PREVALENCE OF HEADACHE AND ITS CHARACTERISATION AFTER INTERMITTENT PHOTIC STIMULATION IN PATIENTS UNDERGOING EEG.

6. BRIEF RESUME OF THE INTENDED WORK

6.1 NEED FOR THE STUDY

Migraine and epilepsy are both common neurological disorders, although migraine is more frequent. Numerous studies have observed an association between the two disorders.[1] Although epilepsy and migraine have distinct clinical manifestations, an important similarity is that they are both episodic disorders in which patients are affected with symptoms sporadically and the interictal interval between the appearance of symptoms is variable; between attacks, affected individuals may be symptom free.[2]

Probably the most common relationship between seizures and migraine is when migraine-like headaches occur after seizures. Postictal headaches are often indistinguishable from migraine and are equally common in patients with or without a family history of migraine.

Post-ictal headache (PIH) can be of the migraine type, tension type or unclassified type of headache. Several researchers have pointed out that the PIH has similar symptoms to migraine such as pounding pain and accompanying nausea, photophobia and phonophobia in a significant proportion of patients (41–56%). In addition, an effect of antimigraine drugs on PIH has been found in some cases.[3,4] Especially the association of epilepsy and migrainous post-ictal headache (PIH) is interesting since they are paroxysmal, chronic and both often respond to antiepileptic drugs although their specific pathophysiological mechanisms are not well known.

Intermittent photic stimulation (IPS) is a common procedure performed in the electroencephalography (EEG) laboratory in children and adults to detect abnormal epileptogenic sensitivity to flickering light (i.e., photosensitivity). Intermittent photic stimulation (IPS) is used as one of the activating methods in electroencephalography (EEG) recordings in the investigation of patients with suspected or known epilepsy.[5]

Although we do not yet fully understand the underlying mechanisms shared by headache, epilepsy, and photosensitivity, all three conditions are related to intermittent changes in brain excitability and are known to facilitate each other. This

interaction emerges, for example, from EEG abnormalities and related clinical phenomena evoked by intermittent photic stimulation (IPS), which can induce photo paroxysmal EEG responses (PPR), migraine and epileptic seizures.[6]

Since epileptic patients are usually more concerned about their seizures than about headache, headache symptoms are often neglected by both patients and treating physicians. This might explain why these disorders are generally viewed as two separate paroxysmal diseases that are considered to express, at most, epidemiological and clinical comorbidity.[7-9] Recognition of headache as an epileptic manifestation per se represents a challenge yet.

The aim of this study is therefore to study the prevalence of headache in patients undergoing EEG with intermittent photic stimulation, its characterization, and to discuss the temporal and etiopathogenetic relationships between headache, epilepsy, and photosensitivity.

6.2 REVIEW OF LITERATURE

In 1906, the British neurologist Sir William R. Gowers delivered a clinical lecture at the National Hospital for the Paralysed and Epileptic, Queen Square, London in which he pointed out the resemblance between migraine and epilepsy. He argued that migraine is a borderland disease to epilepsy: “near it but not of it.” Gowers recognized that migraine and epilepsy often occur together in the same patient and that the two conditions are similar in their “character and nature.”[1]

Fred Andermann, in the introduction to the book Migraine and Epilepsy, published in 1987, proposed the following possible explanations for the comorbidity between migraine and epilepsy:[1] both are common and therefore will co-occur by chance,[2] they are causally related, with one leading to the other, and[3] there is a shared pathophysiological or genetic basis.[10-11]In 1960, William G. Lennox and his daughter Margaret A. Lennox writing in their book Epilepsy and Related Disorders recognized a condition they termed “migralepsy” in which “ophthalmic migraine with perhaps nausea and vomiting [is] followed by symptoms characteristic of epilepsy.”[12]

Individuals with epilepsy are 2.4 times more likely to suffer from migraine than their relatives without epilepsy.[13] Baulac found an epilepsy prevalence of 5.9% in a population of 1830 migraine patients.[14] In another study, the prevalence of epilepsy in people with migraine ranged from 1 to 17%, with a median of 5.9%, which is substantially higher than the 0.5% prevalence of epilepsy in the general population.[7-10]

Regarding ‘‘ictal epileptic headache’’, alone or associated with other ictal epileptic manifestations, it should be borne in mind that headache may be associated with ictal sensory and motor features more frequently than the literature suggests; indeed, this association might be strongly underestimated owing to impaired consciousness during focal seizures with or without secondary generalization.
In this respect, an ictal EEG (during the migraine attack) should be recommended in every migraine patient, even in subjects who are not known to be epileptic. During an inter-ictal EEG (or video-EEG) recording, particular attention should always be paid to the ictal onset of the clinical EEG findings (and not the EEG abnormalities alone,

which are relatively common) during IPS, performed according to the standardized international protocol.[14]

Photosensitivity is an epileptic reaction to visual stimuli. A distinction can be made between the epileptiform EEG responses to IPS during an EEG recording (the so-called photo paroxysmal responses: PPRs) and clinical signs and symptoms, either evoked by IPS or by visual stimuli in daily life, such as disco lights, TV and video games.[6]

The likelihood of an ictal (epileptic) headache appears to be greater when both migraine and epilepsy occur in the same family.[15,16] Photic stimulation during EEG recording in patients with a history of headache and with a family history of migraine and epilepsy may contribute to a correct diagnosis and optimal care of the patient.[16] It can be very difficult to discriminate between photosensitive epilepsy and migraine with clinical history alone because sensitivity to light (photophobia) and provocation by strong lights are difficult to disentangle for the patient as well as the treating physician.

From both a genetic and clinical point of view, the concept of a ‘‘continuum’’, or maybe even a complete ‘‘overlap’’, between headache and epilepsy is gaining increasingly strong evidence-based support. Indeed, a novel SCN1A L263V mutation in a family with co-segregating hemiplegic migraine (FHM) and epilepsy[17] and a Na-K-ATPase pump defect[18] have been documented. Moreover, up to 75% of FHM families have a mutation in the P/Q-type calcium channel Ca(v)2.1 subunit CACNA1A gene on chromosome 19p13, while a candidate region of 9.95 cM (5.96 Mb) between markers GATA152H04 and D9S253 located at chromosome 9q21–q22 was identified in a large Belgian family with occipitotemporal lobe epilepsy associated with migraine with visual aura.[19]

The evaluation of the impact of headaches on the quality of life of subjects with epilepsy also lacks a proper questionnaire developed specifically for this purpose. Some studies have attempted to evaluate the burden of headache in patients with epilepsy by applying the Qolie- 10 questionnaire and a Headache-Attributed Lost Time (HALT) index but possibly neither of these is effective for analysing those

conditions as comorbidities in the same patient since they originally designed to evaluate the quality of life associated with each condition, epilepsy and headache, separately.[20]

Early anticipation of headache and proper simple measures like history taking can lead to early detection of this comorbidity in epilepsy patients. Early detection can influence the choice of antiepileptic drug; thereby selecting a common therapy leads to control of both epilepsy and headache reducing the morbidity and mortality among patients.[21]

Recent studies with new methods such as positron-emission tomography or functional MRI have confirmed the changes in blood flow during migraine attack Bowyer *et al.* conducted magnetoencephalographic study during migraine aura and observed neuroelectric activity in not only the occipital area but also in the temporal area.[22]

Generally, peri-ictal headache is often neglected, regardless of its severity, because patients are more concerned about their seizures. Altered cerebral cortex excitability may be the link between these two conditions and photosensitivity shows this. The physician should bear this association in mind when dealing with epileptic and migraine patients to be able to offer such patients an accurate diagnosis and appropriate treatment.[6]

6.3 AIMS AND OBJECTIVES OF THE STUDY

PRIMARY OBJECTIVE

- To study the prevalence of headache and its characterization after intermittent photic stimulation in patients undergoing EEG.

SECONDARY OBJECTIVE-

- To study the past history of migraine in patients having headache after photic stimulation.
- To look for family history in patients having headache post photic stimulation.

7. MATERIALS AND METHODS

7.1 SOURCE OF DATA

Study Design – Observational study.

Study Place- EEG Lab, Neurology Department, Dayanand Medical College and Hospital, Ludhiana.

Duration of the study- 1st December,2022 to 1st December ,2023 – (1 year).

7.2 METHOD OF COLLECTION OF DATA

INCLUSION CRITERIA-

- Patients with age ≥ 8 years presenting to OPD, emergency, ward, undergoing an EEG.

EXCLUSION CRITERIA-

- Patients presenting as status epilepticus.

7.2 METHOD OF COLLECTION OF DATA

Study Protocol:

In this study, we shall be using the following definitions:

- Headache is pain located above the orbitomeatal line.
- Migraine is a recurrent headache disorder that manifests itself in attacks lasting 4–72 h; typical characteristics of migraine are unilateral location, pulsating quality, moderate or severe intensity, aggravation by routine activity and association with nausea and/or photophobia and phonophobia. In children, migraine attacks may last 1–72 h.
- Epilepsy is a chronic neurological condition characterized by recurrent manifestations of excessive and/or hypersynchronous, usually self-limited activity of neurons in the brain.

- Photosensitivity is an epileptic reaction to visual stimuli. A distinction can be made between the epileptiform EEG responses to IPS during an EEG recording (the so-called photo paroxysmal responses: PPRs) and clinical signs and symptoms, either evoked by IPS or by visual stimuli in daily life, such as disco lights, TV, and video games.
- PPRs are abnormal, highly heritable, electroencephalographic responses of the cortical human brain to specific flash frequencies or other visual stimuli. If a PPR is found, the patient is considered IPS-sensitive or photosensitive. Visual sensitivity is defined as the susceptibility to seizures, which are triggered by the physical characteristics of visual stimuli and not by their perceptual properties, i.e., reflex seizures induced by the cognitive effects of visual stimuli.

There shall be conducted a structured interview with each subject using a standardized questionnaire in the format of Google forms that shall be shared on the patient's smart phone via link that will be sent on WhatsApp in their respective languages (Punjabi,Hindi,English).The questionnaire will address characteristics of the headache pain, the duration and severity of headache, and accompanying symptoms such as nausea/vomiting, photophobia or phonophobia. Subjects shall be asked if they had any headaches independent of seizure (interictal headache) about the frequency of those headaches, characteristics of the pain, the severity and duration of those headaches, and accompanying symptoms. A family history of migraine in first degree relatives will also be inquired about.

For data analyses, patients with migraine-like headache will be categorized as migraine-like headache group and patients with other headaches as other headaches group. We shall regard patients with other headaches as controls for the statistical analyses.

One-way analysis of variance (ANOVA) will be used for linear data. Post hoc pairwise multiple comparisons and range tests will be carried out with the Dunnett's test .Kruskal–Wallis test will be used for comparison of seizure frequency. The c^2 test (contingency table analysis) will be used for categorical data. To identify special

conditions responsible for significant c^2 values in the n ¥ m contingency table analysis, the expected number (EN) of patients and adjusted standardized residual (ASR) will be computed for each cell . In accordance with a normal standard deviation, the absolute value of the ASR (z score) will be used to identify cells that vary markedly from independence (i.e. z>1.96 for $P < 0.05$). *P*-values < 0.05 will be taken to be significant. All statistical analyses will be performed with SPSS ver.9.0.

7.3 DOES THE STUDY REQUIRE ANY INVESTIGATIONS OR INTERVENTIONS TO BE CONDUCTED ON PATIENTS OR OTHER HUMANS OR ANIMALS? IF SO, PLEASE DESCRIBE BRIEFLY.

EEG with intermittent photic stimulation.

7.4 HAS ETHICAL CLEARANCE BEEN OBTAINED FROM YOUR INSTITUTION IN CASE OF 7.3?

Yes, Attached herewith.

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PROFORMA

Study Id No.			
Name		**MRD No.**	
Date & time		**Age**	
Contact No.		**Gender**	
Occupation			
Address			
Diagnosis			

Migraine ID Questionnaire
(Answering "yes'' to two out of three of these simple questions effectively identifies migraine sufferers)

1. Has a headache limited your activities for a day or more in the last three months?
   Yes □ No □
2. Are you nauseated sick to your stomach when you have a headache?
   Yes □ No □
3. Does light bother you when you have a headache?
   Yes □ No □

****
Family details

Relation	Name	Age	Address & Contact No.	Positive – (Mig/Epi)	Blood Sample Taken	Remark
Father (Biological)						
Mother (Biological)						
Brother 1.						
2.						

3.						
4.						
Sister 1.						
2.						
3.						
4.						
Children Son 1.						
2.						
3.						
4.						
Daughter 1.						
2.						
3.						
4.						

Pedigree Chart

SIGNATURE OF CANDIDATE SIGNATURE OF SUPERVISOR

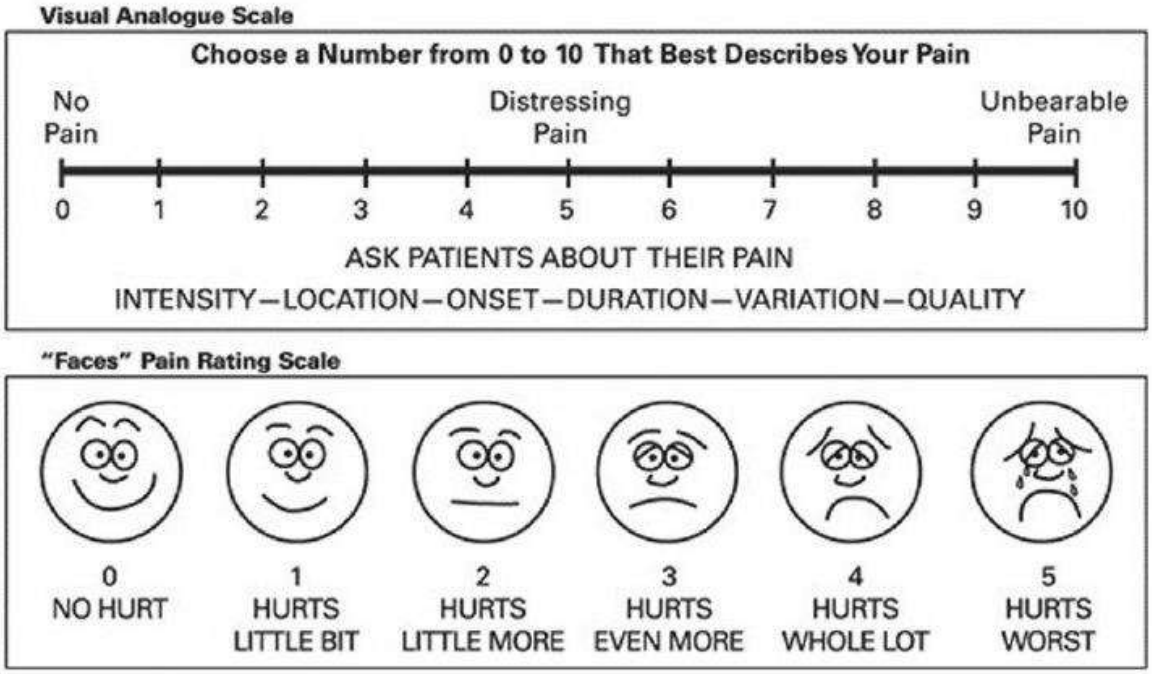
POST INTERMITTENT PHOTIC STIMULATION (EEG)

Was there any headache in last 3 days? Yes/ No

Duration of headache. □ Minutes □ Hours □ Days

Have you experienced similar kind of headache before? Yes/ No

Severity □ Mild □ Moderate □ High □ Very high


Visual Analogue Scale
Choose a Number from 0 to 10 That Best Describes Your Pain
No Pain
Distressing Pain
Unbearable Pain
0 1 2 3 4 5 6 7 8 9 10
ASK PATIENTS ABOUT THEIR PAIN
INTENSITY—LOCATION—ONSET—DURATION—VARIATION—QUALITY
"Faces" Pain Rating Scale
0 NO HURT
1 HURTS LITTLE BIT
2 HURTS LITTLE MORE
3 HURTS EVEN MORE
4 HURTS WHOLE LOT
5 HURTS WORST

Onset of headache after EEG-

Did you require any medicine for relief from headache? Yes / No

SIGNATURE OF CANDIDATE SIGNATURE OF SUPERVISOR

INFORMED PATIENT CONSENT

Date: _____

I…….D/o, W/o, S/o…….
……am willing to participate in the study **"TO STUDY THE PREVALENCE OF HEADACHE AND ITS CHARACTERISATION AFTER INTERMITTENT PHOTIC STIMULATION IN PATIENTS UNDERGOING EEG"** The procedure with its complications have been explained to me in local vernacular language. I have fully understood that no special tests and extra expenditure in any form, merely for the purpose of thesis is being carried out. I am free to opt out the study any time without assigning any reason.

……. ……
Signature of the Witness Signature of the patient

Name:

Signature of Candidate **Signature of Supervisor**

मरीज अनुमति फार्म

तिथि _____

मैं _____ पत्नी/पुत्र/पुत्री _____ निवासी _____ इस शोधकार्य **"TO STUDY THE PREVALENCE OF HEADACHE AND ITS CHARACTERISATION AFTER INTERMITTENT PHOTIC STIMULATION IN PATIENTS UNDERGOING EEG"** में भाग लेने के लिए सहमत हूँ। मैं इस शोधकार्य में भाग लेने के लिए अपनी स्वेच्छा से तैयार हूँ। मैं पुष्टि करता/करती हूँ की यह स्वीकृति देने के लिए मुझे कोई आर्थिक प्रलोभन नहीं दिया गया और न ही दबाव डाला गया है। मुझे इस शोधकार्य का उद्देश्य स्पष्ट कर दिया गया है और मुझे यह विश्वास है की यह विज्ञान और मानवता के लाभ के लिए है। मुझे इस शोधकार्य में होने वाले जोखिम के बारे में समझा दिया गया है और मेरी समझ में यह जोखिम बहुत मामुली है।

मैं इस शोधकार्य में भाग लेने के सम्बन्ध में किसी भी समय अपनी अस्वीकृति व्यक्त कर सकता/सकती हूँ और मेरे अस्वीकृति व्यक्त करने का मेरे इलाज पर कोई प्रभाव नहीं पड़ेगा।

_____ _____

गवाह के हस्ताक्षर रोगी के हस्ताक्षर/अंगूठे का निशान

नाम: नाम:

_____

अन्वेषक के हस्ताक्षर

_____

विद्यार्थी के हस्ताक्षर

ਮਰੀਜ਼ ਰਜ਼ਾਮੰਦੀ ਫਾਰਮ

ਮਿਤੀ_____

ਮੈ_____ਪਤਨੀ/ਪੁੱਤਰ/ਪੁੱਤਰੀ_____

ਵਾਸੀ _____ **"TO STUDY THE PREVALENCE OF HEADACHE AND ITS CHARACTERISATION AFTER INTERMITTENT PHOTIC STIMULATION IN PATIENTS UNDERGOING EEG"** ਤੇ ਚਲ ਰਹੀ ਖੋਜ ਵਿਚ ਹਿੱਸਾ ਲੈਣ ਲਈ ਰਜ਼ਾਮੰਦ ਹਾਂ। ਇਸ ਖੋਜ ਕੰਮ ਵਿਚ ਹਿੱਸਾ ਲੈਣ ਲਈ ਮੈ ਆਪਣੀ ਮਰਜ਼ੀ ਨਾਲ ਤਿਆਰ ਹਾਂ। ਮੈ ਇਹ ਦਸਣਾ ਚਾਹੁੰਦਾ ਹਾਂ/ ਚਾਹੁੰਦੀ ਹਾਂ ਕੇ ਇਹ ਰਜ਼ਾਮੰਦੀ ਦੇਣ ਵਾਸਤੇ ਮੈਨੂ ਕਿਸੇ ਵੀ ਤਰਾਂ ਦਾ ਲੋਭ-ਲਾਲਚ ਨਹੀ ਦਿੱਤਾ ਗਿਆ ਅਤੇ ਨਾ ਹੀ ਕੋਈ ਦਬਾ ਪਾਇਆ ਗਿਆ ਹੈ। ਮੈਨੂ ਇਸ ਖੋਜ ਦਾ ਮਨੋਰਥ ਸਮਝਾ ਦਿੱਤਾ ਗਿਆ ਹੈ ਅਤੇ ਮੈਨੂ ਇਹ ਭਰੋਸਾ ਦਵਾਇਆ ਗਿਆ ਹੈ ਕੇ ਇਹ ਖੋਜ ਵਿਗਿਆਨ ਅਤੇ ਮਾਨਵਤਾ ਦੀ ਭਲਾਈ ਲਈ ਹੈ। ਮੈਨੂ ਇਸ ਖੋਜ ਵਿਚ ਹੋਣ ਵਾਲੇ ਖਤਰੇ ਬਾਰੇ ਸਮਝਾ ਦਿੱਤਾ ਗਿਆ ਹੈ ਅਤੇ ਮੈਨੂ ਇਹ ਯਕੀਨ ਹੈ ਕੇ ਇਹ ਖਤਰਾ ਬਹੁਤ ਮਾਮੂਲੀ ਹੈ। ਮੈਨੂ ਇਸ ਖੋਜ ਕੰਮ ਵਿਚ ਹਿੱਸਾ ਲੈਣ ਦਾ ਢੰਗ – ਤਰੀਕਾ ਸਮਝਾ ਦਿੱਤਾ ਗਿਆ ਹੈ।

ਮੈ ਇਸ ਖੋਜ ਕੰਮ ਵਿਚ ਹਿੱਸਾ ਲੈਣ ਬਾਰੇ ਆਪਣੀ ਰਜ਼ਾਮੰਦੀ ਕਿਸੇ ਵੀ ਸਮੇ ਵਾਪਸ ਲੈ ਸਕਦਾ ਹਾਂ/ ਸਕਦੀ ਹਾਂ ਅਤੇ ਮੇਰੀ ਰਜ਼ਾਮੰਦੀ ਵਾਪਸ ਲੈਣ ਦਾ ਮੇਰੇ ਇਲਾਜ ਤੇ ਕੋਈ ਅਸਰ ਨਹੀ ਹੋਵੇਗਾ।

_____ _____

ਗਵਾਹ ਦੇ ਹਸਤਾਖਰ ਮਰੀਜ਼ ਦੇ ਹਸਤਾਖਰ

ਮਿਤੀ_____ ਮਿਤੀ_____

ਪਤਾ _____ ਪਤਾ _____

_____

ਨਿਰੀਖਕ ਦੇ ਹਸਤਾਖਰ

_____

ਸਿਖਿਆਰਥੀ ਦੇ ਹਸਤਾਖਰ